

APPENDIX A

ERP Projects Evaluation, Phase 1 - Initial Scoping

MEMORANDUM

Date: 3/22/02

To: Terry Mills
Dan Castleberry

From: Bruce DiGennaro
Vance Russell

cc: Bob Twiss

RE: ERP Projects Evaluation, Phase 1 - Initial Scoping

1.0 Introduction

The CALFED Ecosystem Restoration Program (ERP) Projects Evaluation is intended to be a retrospective review of ERP projects funded to date. The evaluation involves three distinct phases:

- Phase 1 – Initial Scoping
- Phase 2 – Pilot Evaluation
- Phase 3 – Comprehensive Evaluation

This memorandum presents summary findings and preliminary recommendations from Phase 1 of the evaluation, which was to refine the overall objectives of the evaluation and to develop a proposed methodology. Based on the recommendations presented herein, Phase 2 of the evaluation will involve reviewing a subset of funded projects to collect initial information and to test and refine the proposed methodology. Results from Phase 2 will be used to design a more comprehensive review of a larger suite of funded projects (Phase 3).

Recommendations presented herein were developed from the results of personal interviews (using a set of standard open-ended questions) and a review of readily available information on ERP projects funded to date, including projects by funding amounts, location and class. Interview results provided the basis for recommended objectives while data on funded projects to date were used to refine the recommended methodology and work plan for Phase 2 of the review (as presented in Attachments A and B respectively).

2.0 Summary of Findings

Phase 1 of the ERP Projects Evaluation focused on a series of scoping interviews and a review and tabulation of readily available information on ERP funded projects. Findings from these two efforts are summarized below.

2.1 Scoping Interviews

Eighteen individuals representing perspectives both from within and from outside the CALFED ERP were interviewed during Phase 1 of the ERP Projects Evaluation (see Table 1). These individuals were identified based on consultation with ERP staff. A standard set of open-ended questions were used in each interview to elicit suggestions and ideas on how to structure the program evaluation (see Attachment C).

Table 1: Individuals interviewed during the look back scoping exercise

Interviewee	Agency	Date interviewed
1. Bob Twiss	ISB	1/15/02
2. Rebecca Fris	ERP	1/17/02
3. Tim Ramirez	Resources Agency	1/18/02
4. Michael Fainter	Stillwater	1/18/02
5. Dick Daniel	CH2M Hill	1/25/02
6. Denise Reed	ISB	1/25/02
7. Michael Healey	ISB	1/25/02
8. Dan Castleberry	ERP	1/29/02
9. Patrick Wright	ERP	1/29/02
10. Wendy Halverson-Martin	ERP	1/29/02
11. Gary Bobker	TBI	1/30/02
12. Lauren Hastings	ERP	1/31/02
13. Sam Luoma	CALFED Science Program	1/31/02
14. Peter Moyle	ISB	1/31/02
15. Wim Kimmerer	ISB	2/1/02
16. David Yargas	Environmental Defense	2/4/02
17. Tom Zuckerman	Agriculture Consultant	2/7/02
18. Diana Jacobs	DFG	2/7/02

Key findings from the interviews include the following:

1. There is a strong interest in determining if, and how, the program, through its funded projects, is fulfilling the stated goals and objectives of the ERP strategic plan.

2. There is an overriding interest in “learning”, both in terms of trying to better determine what the ERP is specifically learning as well as assessing the more basic and general question of “are we learning?”
3. There is a strong desire for a broad descriptive overview of program accomplishments to date in addition to interest in detailed project information.

Other findings of note from the interviews include the following:

- Identifying and assessing impediments to implementation, including institutional barriers such as contracting and regulatory approvals.
- Comparing across projects and improving information sharing, and thus learning.
- Recognizing that it is too early to assess if, or how, the program and its funded projects may be impacting the ecosystem on a large scale.
- Developing a GIS database that can help in tracking and evaluating projects, as well as making project data and findings more readily available in the future.
- Reviewing and evaluating the program from a process and procedural perspective versus reviewing funded projects themselves.

The following highlights responses to several of the specific questions asked during the Phase 1 interviews. This information provides additional perspective on the key findings listed above, which were derived directly from the interviews.

In general, what would you like to get out of the look back exercise? What would you like to learn?

Responses to this question tended to fall into two main categories representing two potentially different objectives for the program evaluation:

- Interest in a descriptive overview of the ERP program accomplishments to date (at an annual report level of detail), including summary statistics such as acres of habitat or miles of streambank restored; and
- Interest in detailed project information capable of supporting a more technical evaluation of on-the-ground activities and how they are contributing to overall program goals and commitments (including commitments to an adaptive management approach).

These perspectives represent two potential approaches to evaluating the ERP Program in terms of progress to date, but at different scales of resolution with potentially different purposes and target audiences.

Interest in the broad “annual report” level review of the ERP Program was oriented towards developing data that could be used to better describe, and ultimately promote the program, particularly to a non-technical audience. This

would include compiling relatively general information regarding major program accomplishments such as total acres of habitat, or miles of stream bank, restored.

Interest in a more detailed technical review was oriented toward identifying and evaluating specific issues such as:

- common constraints to implementation;
- opportunities for standardized monitoring approaches that could better facilitate comparisons across projects;
- information relative to critical uncertainties;
- adaptive management, the use of conceptual models and experimental design;
- data to aid future funding decisions; and
- gaps in information, particularly with respect to specific ERP goals and objectives.

Information regarding these types of specific issues would be valuable for agency and ERP Program staff responsible for planning and administration of specific projects as well as the overall program. Such information could be used not only to assess the status of the program relative to its goals and objectives, but also to improve specific aspects of the program, such as monitoring, implementation, and future funding decisions (both for existing projects and potential future projects). Such information could also be valuable for individuals and organizations involved in implementing the projects themselves, particularly in terms of increased sharing of information across the program. Ultimately, a more detailed evaluation focused on specific issues would provide a more robust analysis of program success and progress to date.

It should be noted that several individuals interviewed also expressed interest in reviewing the ERP Program from more of an administrative and management perspective. Still others also noted an interest in evaluating ecosystem response (i.e. effectiveness), but acknowledged that it is too early to be able to do this (and thus suggested staying away from it).

When asked to select from several possible objectives for the review, the vast majority of individuals interviewed (12 of 18) indicated that “*assessing progress and success to date*” were particularly important. The next most frequently selected objectives were “*identifying impediments to program implementation*” (8 of 18), and “*aiding future ERP planning*” (7 of 18).

Do you think the exercise should include projects in various phases of development, or only focus on those that have made significant progress? Should the evaluation include research projects?

The majority of the individuals interviewed (11 of 18) suggested that the evaluation focus on projects that have made significant progress. However, a number of individuals expressed interest in comparing and contrasting new and old projects by providing a “snapshot” of each. The group was mixed with

respect to the inclusion of research projects, with 8 of 18 indicating that research projects should be included in Phase 2 and the remainder either indicating no or no opinion.

For the pilot exercise, would you prefer a stratified sample of projects, a review of certain types of projects, or a review of projects in a given geographic location/region?

Responses to this question were almost evenly distributed between those that suggested sampling projects by geographic region(s) and those that preferred a sampling by type of project. Several individuals also suggested that the Phase 2 sample should be selected according to the ERP Strategic Plan goals. Others indicated that the level of investment should be a factor and that projects receiving significantly large funding should be reviewed, in part because presumably these projects could be the source of a lot of information due to their size.

What concrete information would like to see from the review?

While there were a variety of responses to this question, it is worth noting that several individuals indicated a desire for a GIS database that would allow better access to, and understanding of the information that is being collected through the ERP. Another common request was the development of maps, graphics, and summary information that could be used to better promote the program and its successes.

2.2 Available Data on ERP Funded Projects

In addition to the scoping interviews, Kleinschmidt conducted a review of readily available information on ERP funded projects. This included data available through CALFED's website as well as tracking reports and CALFED's tracking database. The review did not include information contained in project proposals, progress reports, or final reports.

To date, CALFED has committed a total of approximately \$333 million for 321 projects (in whole or in part) through its Ecosystem Restoration Program (including 61 projects awarded in the 2001 for a total of \$99 million). ERP funded projects are widely distributed geographically and include a wide range of activities from environmental education to physical habitat restoration (representing a variety of habitat types). Between 1995 and 2000, the program funded a total of 260 projects for a total of about \$234 million. Of these 260 projects, 54 have been reported as completed. Table 2 presents a summary of ERP funded projects with regard to types of projects from data contained in the ERP project tracking database.

Key findings from the review of available information include the following:

1. The ERP has developed and maintains a tracking database that includes basic information for all funded projects. The database does not currently include information that specifically ties the projects to ERPP goals and objectives and does not contain summary metrics, such as acres of habitat restored. The database appears to be used primarily as a warehouse of data. Little analysis, or review of the data has been attempted.
2. ERP funded projects are required to submit regular progress reports as well as final reports (as appropriate). These reports are available, but are not widely circulated or used for any particular purpose other than completing contract obligations.
3. There are a number of descriptions available for various funded projects, but these are generally incomplete and/or inconsistent (with regard to level of detail and intent). An effort was recently undertaken to compile descriptions of all Delta ERP projects. However, a review of this information indicates that it is not all current.

Table 2: Summary of ERP funded projects by project class and total funding from 1995-2000.

Project Class	Total Projects	Funding
Fish screens and passage	53	\$71,585,368
Restoration of multiple habitats	22	52,055,110
Ecosystem water and sediment quality	27	23,181,432
Channel dynamics and sediment transport	18	22,350,036
Shallow water tidal and marsh habitat	22	19,315,034
Floodplains and bypasses	9	11,018,329
Local watershed stewardship	39	10,454,306
Riparian habitat	12	7,290,196
Environmental water management	3	5,969,803
Fishery assessment	18	4,234,275
Non-native invasive species	16	3,726,748
Uplands and wildlife friendly agriculture	2	1,744,801
Environmental education	18	793,553
Special status species	1	178,889
		Total: \$233,897,880

3.0 Recommendations

The following is a summary listing of recommendations from Phase 1 of the ERP Projects Evaluation based on the findings of the scoping exercise. Additional recommendations, particularly with regard to the specific design and implementation of Phase 2 of the program evaluation are presented in Attachments A and B to this memorandum.

1. **An overriding goal of the evaluation should be to examine linkages between funded projects and the goals, objectives, and targets of the ERPP and its Strategic Plan, including consistency with the concepts of active adaptive management.** The relationship between funded projects and ERP goals and objectives was mentioned by many of the individuals interviewed during Phase 1. An initial review of the ERP tracking database suggests that projects are not being tracked by ERP goals and that decisions about project funding are being made in the absence of such information. The degree to which funded projects address the 12 uncertainties identified in the ERP Strategic Plan, as well as linkages to ERP milestones should also be examined.
2. **The Projects Evaluation should provide a broad overview of ERP accomplishments to date and a more detailed analysis of specific issues.** The broad review should focus on providing descriptive “annual report” type information, while the detailed review should focus on specific questions regarding the types of data being collected and the types of problems being encountered at specific projects. Results from the scoping interviews indicate that there is strong desire to collect information at both these scales of resolution. While data collection efforts can be designed to simultaneously support both objectives, each has a different orientation (including distinct target audiences) and each may warrant a distinct deliverable.
3. **For Phase 2, a broad “annual report” level evaluation should be conducted for a single region as an initial test case.** There appears to be limited information available relative to funded projects that could be readily compiled to develop summary indicators of progress. The consistency, and comparability of this information is also unclear. Prior to committing resources to a program-wide compilation, the methodology should be thoroughly thought out and tested. We recommend that the Delta region be considered as the pilot region for Phase 2.
4. **The more detailed evaluation for Phase 2 should sample projects from a given geographic areas and from a given suite of projects.** There is interest in investigating projects geographically as well as comparing across specific types of projects. For the purpose of the pilot exercise, we believe it is reasonable to explore and test both lines of investigation. Phase 2 should focus on a limited number of projects (15-30).

5. **The evaluation should focus on projects funded between 1995 and 2000.** There appear to be plenty of projects and materials to support a pilot level review within this group of projects, including projects at various stages of completion. Recently awarded projects (2001 and 2002) are less likely to have progressed to the point of developing information that could be reviewed.

Attachment A Pilot Exercise Design

Broadly speaking, the purpose of the pilot exercise is to provide an objective assessment of ERP progress and learning to date. The pilot will have two primary objectives: 1) to provide a descriptive overview of ERP projects funded to date; and 2) to evaluate project successes, failures and learning to date on 15-30 ERP funded projects. Ultimately, both efforts will aid in answering the broader overall question of if, and how, the ERP is fulfilling its strategic plan goals.

Details on each objective, questions asked of projects, project selection criteria, data collection methods, and expected results for the pilot exercise are outlined in the following sections.

Objective 1: Provide a descriptive overview of ERP projects funded to date

Background

This component of Phase 2 will focus on a “30,000 foot view” of implemented ERP projects within a single CALFED region. The overview will focus on collecting descriptive statistics relative to strategic plan goals addressed, types of projects, dollars invested, total dollars spent and available data on metrics such as miles of stream habitat restored, habitat acreage restored, and fish counts.

Questions

Objective 1 will primarily focus on the following list of questions:

- How is the ERP fulfilling its strategic plan goals? Has it funded projects that address all of the goals? How are dollars allocated across strategic plan goals? How do funded projects relate to specific ERP targets and objectives associated with each goal?
- Where has significant progress been made according to the strategic plan goals and milestones?
- What is the proportion of projects funded to projects implemented? What does this proportion look like with regard to specific strategic plan goals?
- What projects have been implemented and what is the degree/percent of implementation?
- What gaps in information, funding and learning exist?

Data Collection

We will utilize information from the following sources:

- Data mining of proposals, progress reports and annual reports. This may include brief meetings with knowledgeable ERP and agency staff, such as program managers, that have a broad general knowledge of ERP projects.
- “Brief” electronic survey of project proponents designed to fill in gaps on project

information once data mining of deliverables and available information is done. It is expected that the survey will be brief and take participants 10-15 minutes to respond. The survey could either be web based and feed directly into a database or, more simply, be conducted through electronic mail.

- Maps similar to those on the ERP web site. If possible we will manipulate these maps to address the questions above.
- IEP monitoring database, monitoring database from Karl Jacobs at DWR and other project inventories such as the Natural Resources Project Inventory (NRPI).

Expected results

The results from this portion of the pilot will include annual report type information with maps, tables, graphs, and pie charts summarizing the information. A brief summary of findings, gaps in information, and recommendations will accompany the summary statistics and figures.

Objective 2: Evaluate project successes, failures and learning to date on 15-30 ERP funded projects

Background

This component of Phase 2 will focus on what is being done and learned at the project level and how projects compare and/or relate to one another as well as to the program as a whole. Questions will be explored regarding implementation, project design (including experimental design), monitoring, and other aspects of project-level activity. Results will be compared and contrasted across projects and reviewed for implications on the program as a whole. A subset of 15-30 projects will be selected for review. Sampling will be designed to provide information from projects located in a given watershed (to allow for testing a geographic based analysis) and from a select type of project, such as channel manipulations. Sampling from a particular type of project will allow for direct comparisons regarding factors such as monitoring and experimental designs.

Questions

Basic project description

- What are the descriptive aspects of the project: location, type, size, goals, and approach for restoring the ecosystem?
- Which strategic goals of the ERP strategic plan is the project fulfilling? Which of the 12 uncertainties?

Learning

- What are we learning from and across projects? What mechanisms exist for learning across and among projects? What has been learned that will help in future restoration projects? How do the project goals and achievements complement other similar projects in the region or ecosystem?
- What did project proponents do vs. what they said they would do? How were project objectives modified once the project was implemented? What problems and impediments did the proponents face and how did they adjust to those problems?
- What types of impediments to implementation have been encountered (e.g.,

- contracting or permitting barriers)?
- What kinds of partnerships between organizations work for field projects?
- What kinds of measures of success is the project using? What types of quantitative measures (e.g., amount of gravel applied or dirt moved) and measures of environmental change (e.g., how is the project affecting the ecosystem) are used?
- How does the project monitoring tie in to learning and analysis across the ecosystem? What other groups do the project proponents communicate with regularly or occasionally?

Experimental design

- What is the project's experimental design? Is there a working conceptual model? If not, why not? Does the project incorporate adaptive management into implementation? If not why not? Is the adaptive management passive or active?
- Did project proponents conduct pre- and post-project monitoring? What are specific aspects of project monitoring, such as variables, frequency of measure, methods? How is the monitoring data being managed? What are the plans for post project monitoring? How has monitoring data been interpreted and shared?
- What kind of information has the project generated? Is the information useful for future ERP decision-making? What information has not been received that the ERP program needs?

Products

- What are the publications, abstracts, reports, and presentations related to the project that can be provided?
- What are appropriate fields for a georeferenced database to best track, monitor and efficiently look back at project and program accomplishments?

Project selection

Based on the objectives of the review and agency and stakeholder interviews, we recommend that the following be considered in selecting projects for the Phase 2 pilot examination:

1. The project is at least 3 years old and has been completed or is near completion;
2. The project has significant data available for analysis;
3. The project, or group of projects, represents a significant percentage of the funds invested to date.
4. The project is representative of other funded projects.
5. The projects represent different regional areas, including upstream riverine restoration projects and projects within the estuary.

The project selection should involve a combination of general selection criteria together with purposive project sampling, e.g., selecting projects that have data. Since Channel Dynamics includes 18 projects, Shallow Water includes 22 and many of the watershed funded projects have between 10-15, it should be possible, data constraints aside, to pick approximately 10 projects from each category and have a representative sample of each class and for one watershed. These numbers should therefore give programmatic levels of significance in results rather than statistically robust samples.

Data Collection

Data collection will start with the general data from Objective 1. Once specific projects are selected, data collection will proceed to specific project reports and other written products the proponents have produced. Each principal investigator/project manager will then be interviewed, followed by individual and focus group interviews of project implementers and recipients. This multiple data collection approach will best “triangulate” results and ensure objective reporting on each project. Interview questions will be based on the above questions, but will require a testing phase of approximately 5 interviews after which they will be adjusted to improve results. Ideally interviews would be transcribed, coded and analyzed, but due to high costs, we will conduct interviews in teams of two with one person facilitating the interview and the other writing detailed notes. Interviews, however, will be recorded for reference and clarifying data.

Expected results

Results will be compiled into recommendations for conducting a comprehensive look-back exercise as well as the lessons learned during the pilot. Recommendations for designing a georeferenced project database (or adding fields to the existing project tracking database) will also be included. The recommendations will focus on learning and impact at the project level. Products will include a final report, PowerPoint slides as useful as presentations regarding the report and database mockups. A summary of findings for Objective 1 will include figures, graphs and tables in an annual report type format and specific findings from Objective 2 will include summaries and narratives. We expect that final review of the report will be done by appropriate ERP staff, but also selected members of the ISB to strengthen credibility and to give an outside the Bay-Delta ecosystem view of the results.

Attachment B

Proposed Work Plan for Phase 2

The following is a proposed list of tasks for conducting Phase 2 of the ERP Program Evaluation. This work plan assumes that Phase 2 will be conducted according to the recommendations and design methodology outlined in Attachment A.

Task 1 - Compile Data for “Annual Report” Level Evaluation - This task will entail collecting summary level data from all the ERP funded projects. An initial set of statistics will be developed based on the existing goals and objectives of the ERPP as well as relevant ERP milestones. Statistics will be developed for each class of project and will be oriented towards broad overview measures of progress. Sources of information for Task 2 will be project proposals, progress reports, final reports, the tracking database, and existing staff knowledge about the projects.

Task 2 - Develop Summary Information - Using the data compiled in Task 1, summary statistics will be developed that describe accomplishments to date relative to ecosystem restoration. This information will be developed in the form of maps, tables, and graphics that can be used for CALFED’s annual report and other presentations.

Task 3 – Select Projects for Detailed Review – This task will involve applying the project selection criteria and working with ERP staff and others knowledgeable about the various projects to identify specific ERP funded projects that will be reviewed in more detail during Phase 2. Approximately 15-30 projects will be selected for a more detailed review.

Task 4 - Collect Data for Detailed Review - This will include projects representing activity within a given watershed and activity from one or two different classes of projects. A total of not more than 30 projects will be reviewed. Unlike Task 1 above, which focuses on existing secondary data sources, this task will focus on the collection of primary data through focused interviews. A number of specific questions will be asked to assess parameters such as impediments to implementation, the use of conceptual models and adaptive management (including experimental designs), what has worked and what has not, modifications since the original proposal, and project monitoring.

Task 5 - Prepare Final Report - Based upon the experience of the pilot projects a final report will be prepared documenting the pilot evaluation and suggestions for refining the process for a more comprehensive evaluation. The report will also provide a cost estimate and timeline for collecting data on the remaining ERP funded projects.

Attachment C

Scoping Interview Guide for Look-Back Exercise

Objectives

- Refine the objectives for the look-back exercise.
- Identify the specific types of information to be compiled.
- Determine the type of projects/programs to analyze during the look-back exercise.
- Set-forth the types of products and follow-up for the larger program evaluation exercise.

Introduction

- CALFED is planning to initiate a retrospective review of projects funded to date by the ERP.
- The purpose of this call is to get your thoughts on the review and solicit your input on: (1) the objectives of the review and (2) the kinds of information that should be obtained.
- The actual review exercise is planned to occur in two phases with an initial pilot exercise reviewing approximately 30 projects, followed by a more comprehensive review of a larger number of funded projects.
- There are a number of different types of projects that have been funded and a wide variety of information that could be obtained from each. In asking you a few questions, we hope to develop a better understanding of what would be most valuable to review, as well as some ideas on how best to design the pilot exercise.
- This call should take no longer than 20 minutes.

Questions

1. In general, what would you like to get out of the look back exercise? What would you like to learn?
2. Some possible objectives of the exercise include:
 - assessing program and/or project progress and success to date
 - identifying restoration actions that have worked and those that have not
 - assessing the benefits of the ERP to the Bay-Delta ecosystem
 - aiding future ERP planning
 - identifying impediments to program implementationWhich of these possible objectives do you feel are particularly important? What other objectives would you suggest?
3. What specific pieces of information do you feel should be compiled?
4. What specific types of projects should the analysis focus on? List.
5. Do you think the exercise should include projects in various phases of development, or only focus on those that have made significant progress? Should the evaluation include research projects?
6. What specific questions do you think should be asked relative to each project?
7. For the pilot exercise, would you prefer a stratified sample of projects, a review of certain types of projects, or a review of projects in a given geographic location/region?
8. What concrete information would like to see from the review?

APPENDIX B

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-01-N07	Sedimentation in the Delta and Suisun Bay	Channel Dynamics and Sediment Transport	Delta & East Side Tributaries	\$1,367,684.00
ERP-99-N06	Linked Hydrogeomorphic Ecosystem Models to Support Adaptive Management	Channel Dynamics and Sediment Transport	Delta & East Side Tributaries	\$1,546,016.00
ERP-98-B08	Cache Slough Habitat Enhancement	Channel Dynamics and Sediment Transport	Delta & East Side Tributaries	\$85,000.00
ERP-97-B02	Sedimentation Movement and Availability and Monitoring in the Delta	Channel Dynamics and Sediment Transport	Delta & East Side Tributaries	\$1,047,010.00
ERP-97-N11	In-Channel Island Restoration/Demonstration (Phase 1: Permitting and Design)	Channel Dynamics and Sediment Transport	Delta & East Side Tributaries	\$270,270.00
ERP-98-F15	Lower Clear Creek Floodway Restoration Project (Phase II)	Channel Dynamics and Sediment Transport	Sacramento	\$3,559,596.00
ERP-97-N07	Cottonwood Creek Channel Restoration Planning	Channel Dynamics and Sediment Transport	Sacramento	\$61,000.00
ERP-01-N03	Tuolumne River Restoration: Special Run Pool 10	Channel Dynamics and Sediment Transport	San Joaquin	\$543,530.00
ERP-01-N06	Revised Phase 2 - Merced River Salmon Habitat Enhancement: River Mile 42 to 44 (Robinson Ranch Site)	Channel Dynamics and Sediment Transport	San Joaquin	\$1,699,101.00
ERP-01-N09	Tuolumne River Fine Sediment Management	Channel Dynamics and Sediment Transport	San Joaquin	\$910,486.00
ERP-01-N61	Tuolumne River Mining Reach Restoration No 3, Warner-Deardorff Segment	Channel Dynamics and Sediment Transport	San Joaquin	\$910,486.00
ERP-99-B04	Merced River Salmon Habitat Enhancement: Lower Western Stone Site	Channel Dynamics and Sediment Transport	San Joaquin	\$130,000.00
ERP-99-B05	Merced River Salmon Habitat Enhancement (Phase I: Ratzlaff Reach)	Channel Dynamics and Sediment Transport	San Joaquin	\$1,586,350.00
ERP-99-F01	Tuolumne River Run Pool 10 Restoration	Channel Dynamics and Sediment Transport	San Joaquin	\$165,000.00
ERP-99-F02	Tuolumne River Mining Reach Restoration	Channel Dynamics and Sediment Transport	San Joaquin	\$3,332,050.00
ERP-98-C04/C05	Basso Bridge and Merced River Ranch Land Acquisition	Channel Dynamics and Sediment Transport	San Joaquin	\$830,500.00
ERP-98-F06	Tuolumne River Setback Levees and Channel Restoration	Channel Dynamics and Sediment Transport	San Joaquin	\$1,362,000.00
ERP-98-F11	Merced River Salmon Habitat Enhancement (Phase III)	Channel Dynamics and Sediment Transport	San Joaquin	\$2,433,759.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-97-C11	Gravel at Basso Bridge	Channel Dynamics and Sediment Transport	San Joaquin	\$250,975.00
ERP-97-M08	Tuolumne River Channel Restoration (Pool 9)	Channel Dynamics and Sediment Transport	San Joaquin	\$2,353,100.00
ERP-97-M09	Tuolumne River Mining Reach Restoration	Channel Dynamics and Sediment Transport	San Joaquin	\$2,801,000.00
ERP-97-N21	Knights Ferry Gravel Replenishment	Channel Dynamics and Sediment Transport	San Joaquin	\$536,410.00
ERP-99-B10	Species & Community Profiles of the SF Bay Area Wetlands Ecosystem Goals Project	Ecosystem Water & Sediment Quality	Bay	\$45,320.00
ERP-99-N07	Chronic Toxicity of Environmental Contaminants in Sacramento Splittail - A Biomarker Approach	Ecosystem Water & Sediment Quality	Bay	\$673,684.00
ERP-98-B09	IPM Partnership to Improve Water Quality in Suisun Bay and Local Creeks	Ecosystem Water & Sediment Quality	Bay	\$266,000.00
ERP-01-N20	Transport, Transformation & Effects of Se and C in the Delta: Implications for ERP	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$2,600,000.00
ERP-01-N21	Large-Scale Pilot Demonstration of Passivation Technology For Restoration of Newton Copper Mine	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$60,000.00
ERP-00-G01	Dissolved Organic Carbon Release - Delta Wetlands Part 2	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$1,030,000.00
ERP-99-B17	Dissolved Organic Carbon Release from Delta Wetlands, Part 1	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$1,434,449.00
ERP-98-B07	Evaluation of Selenium Sources, Levels, and Consequences in the Delta	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$1,627,117.00
ERP-98-C09A	Delta Dredging Reuse Strategy	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$24,000.00
ERP-98-C09b	Delta Dredging Reuse Strategy	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$276,000.00
ERP-98-C09c	Delta Dredging Reuse Strategy	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$200,000.00
ERP-97-C05	Effects of Wetlands Restoration on Methyl Mercury Levels	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$546,171.00
ERP-97-C06	Contaminant Effects on Smelt	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$437,326.00
ERP-97-N09	Monitoring of Delta Contaminants	Ecosystem Water & Sediment Quality	Delta & East Side Tributaries	\$100,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-01-N22	Rainbow Trout Toxicity Monitoring: An Evaluation of the Role of Contaminants on Anadromous Salmonids	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$530,000.00
ERP-99-B06	Assessment of Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$4,164,000.00
ERP-99-N08	Assessment of Pesticide Effects on Fish & Their Food Resources in the Sacramento/San Joaquin Delta	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$1,586,894.00
ERP-98-C06	Water Quality Criteria for Chlorpyrifos and Diazinon	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$67,753.00
ERP-98-C07	Fathead Minnow Toxicity Study in the Sacramento River	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$400,000.00
ERP-98-C08	Algae Toxicity Study	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$500,000.00
ERP-97-B06	Assessment of Organic Matter in the Habitat and its Relationship to the Food Chain	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$1,440,649.00
ERP-97-C12	Evaluation of Alternative Pesticide Use Reduction Practices	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$1,113,781.00
ERP-97-N20	Implementing Programs to Reduce the Use of Pesticides and Fertilizers in Sacramento and San Joaquin Watersheds	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$1,680,631.00
ERP-95-M06	Implementing Programs to Reduce the Use of Pesticides and Fertilizers in Sacramento and San Joaquin Watersheds (BIOS)	Ecosystem Water & Sediment Quality	Entire Bay-Delta Watershed	\$660,000.00
ERP-00-B05	Adaptive Real-Time Water Quality Management of Seasonal Wetlands in the Grassland Water District	Ecosystem Water & Sediment Quality	Sacramento	\$671,900.00
ERP-98-B05	Sand and Salt Creek Watershed Project	Ecosystem Water & Sediment Quality	Sacramento	\$599,000.00
ERP-97-N01	Reduction of Diazinon and Chlorpyrifos (Sacramento)	Sediment Quality	Sacramento	\$663,500.00
ERP-98-B14	Bacterial treatment of Selenium in the Panoche Drainage	Ecosystem Water & Sediment Quality	San Joaquin	\$1,149,000.00
ERP-99-B16	Determination of the Causes of Dissolved Oxygen Depletion in the SJ River	Ecosystem Water & Sediment Quality	San Joaquin	\$892,400.00
ERP-97-C08	San Joaquin River Real-time Water Quality Management Program	Ecosystem Water & Sediment Quality	San Joaquin	\$931,857.00
ERP-01-N34	Estuary Action Challenge Environmental Education Project	Environmental Education	Bay	\$50,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-01-N37	Environmental Stewardship Educational Conferences and Tours	Environmental Education	Bay	\$48,500.00
ERP-01-N39	Adopt-A-Watershed Leadership Institute	Environmental Education	Bay	\$592,884.00
ERP-01-N38	Delta Studies Program: San Joaquin County Schools	Environmental Education	Delta & East Side Tributaries	\$306,291.00
ERP-98-B34	Discover the Flyway	Environmental Education	Delta & East Side Tributaries	\$49,000.00
ERP-98-B38	Stone Lakes Water Hyacinth Education Program	Environmental Education	Delta & East Side Tributaries	\$9,600.00
ERP-01-N36	Traveling Film Festival/San Joaquin River Oral History Film	Environmental Education	Entire Bay-Delta Watershed	\$281,316.00
ERP-01-N41	Bay-Delta Learning Initiative	Environmental Education	Entire Bay-Delta Watershed	\$126,668.00
ERP-99-B20	Sacramento River Discovery Center	Environmental Education	Entire Bay-Delta Watershed	\$39,552.00
ERP-99-B21	Estuary Action Challenge Environmental Education Project	Environmental Education	Entire Bay-Delta Watershed	\$51,500.00
ERP-99-B22	Water Challenge 2010 Exhibit	Environmental Education	Entire Bay-Delta Watershed	\$52,015.00
ERP-99-B24	Traveling Film Festival Exhibit	Environmental Education	Entire Bay-Delta Watershed	\$51,500.00
ERP-99-B26	1999/2000 Bay-Delta Education Program	Environmental Education	Entire Bay-Delta Watershed	\$33,269.00
ERP-99-B27	Watershed Educational Training	Environmental Education	Entire Bay-Delta Watershed	\$13,390.00
ERP-98-B31	Traveling Film Festival / Heron Booth / Video Archive	Environmental Education	Entire Bay-Delta Watershed	\$54,000.00
ERP-98-B32	Environmental Agriculture Conferences and Field Tours	Environmental Education	Entire Bay-Delta Watershed	\$28,000.00
ERP-98-B36	Bay-Delta Environmental Restoration Education Program	Environmental Education	Entire Bay-Delta Watershed	\$40,000.00
ERP-98-B39	Water Challenge 2010	Environmental Education	Entire Bay-Delta Watershed	\$64,500.00
ERP-01-N33	Watershed Education, Headwaters to the Ocean	Environmental Education	Sacramento	\$321,816.00
ERP-01-N35	Watershed Education Project	Environmental Education	Sacramento	\$100,865.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-01-N40	Discover the Flyway II	Environmental Education	Sacramento	\$197,987.00
ERP-01-N42	Educating Farmers and Landowners in Biological Resource Management	Environmental Education	Sacramento	\$1,066,593.00
ERP-99-B23	The Learning Watershed Project	Environmental Education	Sacramento	\$56,907.00
ERP-98-B33	Sacramento River, Headwaters to the Ocean, Public Information and Education	Environmental Education	Sacramento	\$49,640.00
ERP-98-B35	The Butte Creek Watershed Educational Workshops and Field Tours Series	Environmental Education	Sacramento	\$33,000.00
ERP-00-B04	Focused Action to Develop Ecologically-based Hydrologic Models and Water Management Strategies in the San Joaquin Basin	Environmental Water Management	San Joaquin	\$304,803.00
ERP-99-B29	San Joaquin River Pilot Project	Environmental Water Management	San Joaquin	\$2,575,000.00
ERP-99-B30	Water Acquisition	Environmental Water Management	San Joaquin	\$3,090,000.00
ERP-99-B25	River Studies Center Exhibits & Programs	Environmental Education	San Joaquin	\$70,467.00
ERP-98-B30	San Joaquin Valley Salmonids in the Classroom Program Enhancement	Environmental Education	San Joaquin	\$3,000.00
ERP-98-B40	Tuolumne River Natural Resources Program	Environmental Education	San Joaquin	\$94,213.00
ERP-98-B23	Steelhead and Chinook Salmon Fish Passage Barrier Remediation on the Guadalupe River	Fish Screens and Passage	Bay	\$178,200.00
ERP-95-M07	Fish Screen Construction	Fish Screens and Passage	Bay	\$450,000.00
ERP-01-N57	Lower Mokelumne River Restoration Program - Phase 2 (Woodbridge)	Fish Screens and Passage	Delta & East Side Tributaries	\$680,000.00
ERP-01-N59	Stockton East Water District and Calaveras County Water District Fish Screen Facilities - Calaveras River	Fish Screens and Passage	Delta & East Side Tributaries	\$670,000.00
ERP-98-B11	Woodbridge Fish Screen and Passage	Fish Screens and Passage	Delta & East Side Tributaries	\$1,575,000.00
ERP-98-B25	Cosumnes River Salmonid Barrier Program	Fish Screens and Passage	Delta & East Side Tributaries	\$188,255.00
ERP-98-B27	Hastings Tract Fish Screen (Phase II: Construction)	Fish Screens and Passage	Delta & East Side Tributaries	\$271,250.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-98-C16	Developing a Methodology to Accurately Simulate Entrainment of Fish (Pump Barge Study)	Fish Screens and Passage	Delta & East Side Tributaries	\$200,000.00
ERP-98-R01	Small Diversion Fish Screen Program	Fish Screens and Passage	Delta & East Side Tributaries	\$900,000.00
ERP-97-M06	Hastings Tract Fish Screen (Phase I: Feasibility Study)	Fish Screens and Passage	Delta & East Side Tributaries	\$27,000.00
ERP-99-N02	Fish Treadmill Developed Fish Screen Criteria for Native Sacramento-San Joaquin Watershed Fishes	Fish Screens and Passage	Entire Bay-Delta Watershed	\$823,000.00
ERP-98-N02	Expanding California Salmon Habitat to Alter Dams and Diversions	Fish Screens and Passage	Entire Bay-Delta Watershed	\$49,000.00
ERP-96-M23	Innovative Fish Screen for Small Diversions Demonstration Project	Fish Screens and Passage	Entire Bay-Delta Watershed	\$90,000.00
ERP-01-N51	City of Sacramento Intake Fish Screen Replacement Project	Fish Screens and Passage	Sacramento	\$6,020,995.00
ERP-01-N52	Sacramento River Fish Small Screen Project Vertical River Pump Diversions	Fish Screens and Passage	Sacramento	\$1,800,000.00
ERP-01-N53	White Mallard Dam and Associated Diversions	Fish Screens and Passage	Sacramento	\$84,938.00
ERP-01-N54	Lower Butte Creek Project: Phase III Facilitation/Coordination and Construction of Three Fish Passage Modifications to Sutter Bypass West Side Water Control Structures	Fish Screens and Passage	Sacramento	\$4,783,719.00
ERP-01-N55	RD 2035 Fish Screen Design and Environmental Review	Fish Screens and Passage	Sacramento	\$1,820,000.00
ERP-01-N58	Fish Passage Improvement Project at the Red Bluff Diversion Dam - Balance of Phase II Funding with Requested Change of Scope	Fish Screens and Passage	Sacramento	\$1,574,000.00
ERP-01-N60	American Basin Fish Screen & Habitat Improvement Project	Fish Screens and Passage	Sacramento	\$950,000.00
ERP-00-B01	City of Redding Water Utility Fish Screen Rehabilitation	Fish Screens and Passage	Sacramento	\$510,262.00
ERP-00-B02	Maxwell Irrigation District Tuttle Pump Relocation Project	Fish Screens and Passage	Sacramento	\$440,737.00
ERP-00-R01	Sacramento River Small Diversion Fish Screen Program - Mechanical Monitoring and Maintenance Project	Fish Screens and Passage	Sacramento	\$322,081.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-99-B01	Battle Creek Salmon and Steelhead Restoration Project	Fish Screens and Passage	Sacramento	\$28,000,000.00
ERP-99-B02	Lower Butte Creek Project (Phase II: Preliminary Engineering and Environmental Analysis)	Fish Screens and Passage	Sacramento	\$775,000.00
ERP-99-B03	ACID Fish Passage and Fish Screen Improvement Project, Phase III	Fish Screens and Passage	Sacramento	\$5,253,000.00
ERP-99-B07	Fish Passage Improvement Project at the Red Bluff Diversion Dam	Fish Screens and Passage	Sacramento	\$1,030,000.00
ERP-99-B08	Improve Upstream Ladder & Barrier Weir @Coleman Nat'l Fish Hatchery at Battle Creek	Fish Screens and Passage	Sacramento	\$2,500,000.00
ERP-99-N01	Anderson-Cottonwood Irrigation District Fish Screen	Fish Screens and Passage	Sacramento	\$5,100,000.00
ERP-98-B01	Richter Brothers Screen, Phase I	Fish Screens and Passage	Sacramento	\$49,000.00
ERP-98-B02	Boeger Family Farm Screen - Feasibility Study Phase I	Fish Screens and Passage	Sacramento	\$15,000.00
ERP-98-B03	Anderson-Cottonwood Irrigation District fish passage	Fish Screens and Passage	Sacramento	\$325,000.00
ERP-98-B16	Battle Creek Screens and Fish Passage	Fish Screens and Passage	Sacramento	\$395,000.00
ERP-98-B21	Anadromous Fish Passage at Clough Dam on Mill Creek	Fish Screens and Passage	Sacramento	\$1,215,000.00
ERP-98-B22	Fish Passage Improvement Project at the Red Bluff Diversion Dam	Fish Screens and Passage	Sacramento	\$340,600.00
ERP-98-B24	Anderston Cottonwood Irrigation District Fish Passage and Fish Screen Improvement Project, Phase II, Final Design	Fish Screens and Passage	Sacramento	\$860,000.00
ERP-98-B26	Boeger Family Farm Fish screen Phase II: Construction	Fish Screens and Passage	Sacramento	\$139,500.00
ERP-98-B28	City of Sacramento Fish Screen Replacement Project Phase 2 - Design	Fish Screens and Passage	Sacramento	\$654,500.00
ERP-98-B29	American Basin Fish Screen and Habitat Improvement Project	Fish Screens and Passage	Sacramento	\$200,000.00
ERP-98-N01	Reclamation District 2035 Fish Screen	Fish Screens and Passage	Sacramento	\$100,000.00
ERP-98-N04		Fish Screens and Passage	Sacramento	\$100,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-97-C01	Wilkins Slough Pumping Plant Fish Screen Project	Fish Screens and Passage	Sacramento	\$2,500,000.00
ERP-97-C02	Princeton Fish Screen Construction	Fish Screens and Passage	Sacramento	\$1,750,000.00
ERP-97-C04A	Selected Fish Screens on Sacramento River and Tributaries	Fish Screens and Passage	Sacramento	\$374,850.00
ERP-97-M01	Wilson Ranch Fish Screen Project	Fish Screens and Passage	Sacramento	\$200,000.00
ERP-97-M02	Battle Creek Screens and Fish Passage	Fish Screens and Passage	Sacramento	\$395,000.00
ERP-97-M03	Gorrill Dam Screen and Ladder	Fish Screens and Passage	Sacramento	\$369,641.00
ERP-97-M04	Adams Dam Screen and Passage	Fish Screens and Passage	Sacramento	\$217,000.00
ERP-97-M05	Saeltzer Dam Fish Passage	Fish Screens and Passage	Sacramento	\$238,200.00
ERP-96-M01	Construct Siphon & Associated Improvements.	Fish Screens and Passage	Sacramento	\$3,095,873.00
ERP-96-M04	Princeton Pumping Plant Fish Screen (Phase 1-Feas.)	Fish Screens and Passage	Sacramento	\$75,000.00
ERP-96-M05	Princeton-Codora-Glenn Fish Screen (Phase I: Feasibility Engineering)	Fish Screens and Passage	Sacramento	\$75,000.00
ERP-96-M07	Princeton-Codora-Glenn Fish Screen (Phase II: Construction)	Fish Screens and Passage	Sacramento	\$5,500,000.00
ERP-96-M17	Yuba River Fish Screen Replacement	Fish Screens and Passage	Sacramento	\$114,750.00
ERP-96-M19	Wilkins Slough Fish Screen - Feasibility and Preliminary Design	Fish Screens and Passage	Sacramento	\$100,000.00
ERP-96-M21	Adams Dam Fish Screen & Ladder	Fish Screens and Passage	Sacramento	\$70,304.00
ERP-96-M22	Gorrill Dam Fish Screen & Ladder	Fish Screens and Passage	Sacramento	\$67,990.00
ERP-95-M02	Fish Screen and Ladder Construction	Fish Screens and Passage	Sacramento	\$316,500.00
ERP-95-M05	Pump Station Relocation Construction - M&T Ranch	Fish Screens and Passage	Sacramento	\$1,610,000.00
ERP-01-N56	Patterson Irrigation District Positive Barrier Fish Screen on San Joaquin River Diversion	Fish Screens and Passage	San Joaquin	\$175,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-97-M07	Banta-Carbona Irrigation District Fish Screen Project	Fish Screens and Passage	San Joaquin	\$938,875.00
ERP-96-M20	Fish Screen Project	Fish Screens and Passage	San Joaquin	\$100,000.00
ERP-01-N48	Juvenile Salmon Migratory Behavior Study in North, Central and South Delta	Fishery Assessment	Delta & East Side Tributaries	\$210,000.00
ERP-01-N50	Food Resources for Zooplankton in the Sacramento-San Joaquin River Delta	Fishery Assessment	Delta & East Side Tributaries	\$576,422.00
ERP-00-B03	Culture of Delta Smelt Phase II & III	Fishery Assessment	Delta & East Side Tributaries	\$576,229.00
ERP-98-C02	Culture of Delta Smelt	Fishery Assessment	Delta & East Side Tributaries	\$194,870.00
ERP-96-M27	North Delta Area - Juvenile Salmon Rearing	Fishery Assessment	Delta & East Side Tributaries	\$24,500.00
ERP-00-B06	Biological Assessment of Green Sturgeon, Phase II	Fishery Assessment	Entire Bay-Delta Watershed	\$211,164.00
ERP-99-N12	Central Valley Steelhead Genetic Evaluation	Fishery Assessment	Entire Bay-Delta Watershed	\$70,636.00
ERP-99-N13	Development of a Comprehensive Implementation Plan for a Statistically Designed Marking & Recovery Plan	Fishery Assessment	Entire Bay-Delta Watershed	\$74,951.00
ERP-98-B15	Evaluation of Tagging Data	Fishery Assessment	Entire Bay-Delta Watershed	\$697,632.00
ERP-98-C15	Biological Assessment of Green Sturgeon in the Sacramento-San Joaquin Watershed	Fishery Assessment	Entire Bay-Delta Watershed	\$241,000.00
ERP-96-M11	Applied Research to Identify Chinook Salmon Runs via Genetics	Fishery Assessment	Entire Bay-Delta Watershed	\$450,000.00
ERP-95-M08	Winter-run Chinook Salmon Captive Broodstock Program	Fishery Assessment	Entire Bay-Delta Watershed	\$300,000.00
ERP-01-N44	Estimating the Abundance of Sacramento River Juvenile Winter Chinook Salmon with Comparisons to Adult Escapement	Fishery Assessment	Sacramento	\$1,081,638.00
ERP-01-N45	Battle Creek Anadromous Salmonid Monitoring Projects	Fishery Assessment	Sacramento	\$1,576,152.00
ERP-01-N46	Sacramento River Winter Chinook Salmon Carcass Survey	Fishery Assessment	Sacramento	\$305,273.00
ERP-01-N47	Clear Creek Juvenile Salmonid Monitoring Project	Fishery Assessment	Sacramento	\$871,026.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-01-N49	Butte Creek, Big Chico Creek, and Sutter Bypass Chinook Salmon and Steelhead Evaluation	Fishery Assessment	Sacramento	\$280,951.00
ERP-98-C12	Genetic Comparison of Steelhead Stocks in Clear Creek	Fishery Assessment	Sacramento	\$45,493.00
ERP-98-C13	Spawning Areas of Green Sturgeon in the Upper Sacramento River	Fishery Assessment	Sacramento	\$60,801.00
ERP-98-C14	Monitoring Spring and Winter-run Chinook Salmon and Steelhead in Battle Creek	Fishery Assessment	Sacramento	\$150,000.00
ERP-98-N03	Life History and Stock Composition of Steelhead Trout	Fishery Assessment	Sacramento	\$120,000.00
ERP-96-M12	Battle Creek - Chinook Salmon & Steelhead Restoration Study	Fishery Assessment	Sacramento	\$306,000.00
ERP-99-B19	Health Monitoring of Hatchery & Natural Fall-run Chinook in SJ River	Fishery Assessment	San Joaquin	\$38,996.00
ERP-98-C11	Chinook Salmon Movement in the Lower SJR and South Delta	Fishery Assessment	San Joaquin	\$285,000.00
ERP-97-C09	Developing a Genetic Baseline for San Joaquin Salmon	Fishery Assessment	San Joaquin	\$387,003.00
ERP-01-N10	Cosumnes/Mokelumne Corridor Floodplain Acquisitions, Management, and Restoration Planning	Flood Plains and Bypasses	Delta & East Side Tributaries	\$3,044,342.00
ERP-99-A01	Inundation of a Section of the Yolo Bypass to Restore Sacramento Splittail & Other Native Species.	Flood Plains and Bypasses	Delta & East Side Tributaries	\$820,679.00
ERP-99-C01/C02	Cosumnes and Mokelumne Rivers Feasibility Study	Flood Plains and Bypasses	Delta & East Side Tributaries	\$1,007,800.00
ERP-98-B17	Cosumnes Floodplain Acquisition and Restoration	Flood Plains and Bypasses	Delta & East Side Tributaries	\$3,500,000.00
ERP-98-F09	Rhode Island Floodplain Management and Habitat Restoration - Phase I	Flood Plains and Bypasses	Delta & East Side Tributaries	\$25,000.00
ERP-98-F19	and Demonstration	Bypasses	Tributaries	\$750,000.00
ERP-96-M13	Yolo Bypass - Habitat Restoration Study	Flood Plains and Bypasses	Delta & East Side Tributaries	\$226,000.00
ERP-01-N12	Yolo Bypass Management Strategy, Phase II	Flood Plains and Bypasses	Sacramento	\$210,000.00
ERP-00-F01	Tuolumne River Bobcat Flat Floodplain Acquisition	Flood Plains and Bypasses	San Joaquin	\$2,043,850.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-99-R01	Floodplain Easements; Lower Tuolumne and San Joaquin (DA9)	Flood Plains and Bypasses	San Joaquin	\$1,545,000.00
ERP-98-F21	Lower San Joaquin River Floodplain Protection and Restoration Project	Flood Plains and Bypasses	San Joaquin	\$1,100,000.00
ERP-01-N27	Sonoma Creek Watershed Conservancy, 2001-2003	Local Watershed Stewardship	Bay	\$545,170.00
ERP-01-N29	Kirker Creek Watershed CRMP Program	Local Watershed Stewardship	Bay	\$198,450.00
ERP-00-E04	Sonoma Creek Watershed Conservancy	Local Watershed Stewardship	Bay	\$438,923.00
ERP-99-N20	Napa River Watershed Stewardship Year 2	Local Watershed Stewardship	Bay	\$191,100.00
ERP-98-E01	Napa River Watershed Stewardship	Local Watershed Stewardship	Bay	\$252,000.00
ERP-98-E02	Sonoma Creek Watershed Enhancement Plan - Phase II	Local Watershed Stewardship	Bay	\$302,000.00
ERP-98-E04	Petaluma River Watershed Restoration Program	Local Watershed Stewardship	Bay	\$220,000.00
ERP-98-E07	Local Watershed Stewardship: Steelhead Trout Plan	Local Watershed Stewardship	Bay	\$47,500.00
ERP-98-E08	Cold Water Fisheries and Water Quality Element	Local Watershed Stewardship	Bay	\$200,000.00
ERP-98-E17	Alhambra Creek Watershed CRMP Program	Local Watershed Stewardship	Bay	\$138,500.00
ERP-01-N32	Watershed Stewardship in Marsh Creek: A Project to Protect Water Quality in the Western Delta	Local Watershed Stewardship	Delta & East Side Tributaries	\$126,000.00
ERP-99-N15	Lower Mokelumne Stewardship	Local Watershed Stewardship	Delta & East Side Tributaries	\$227,000.00
ERP-98-B10	Inventory of Forest Road Systems, Cat Creek Watershed	Local Watershed Stewardship	Delta & East Side Tributaries	\$45,320.00
ERP-98-E11	Yolo Bypass Watershed Restoration Strategy	Local Watershed Stewardship	Delta & East Side Tributaries	\$244,188.00
ERP-98-E12	Local Watershed Stewardship Plan for the Lower Mokelumne River	Local Watershed Stewardship	Delta & East Side Tributaries	\$159,000.00
ERP-01-N30	Digital Soil Survey Mapping and Digital Orthophotoquad Imagery Development	Local Watershed Stewardship	Entire Bay-Delta Watershed	\$502,100.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-99-B14	Biological Ag Systems in Cotton-BASIC-Reducing Synthetic Pesticides & Fertilizers in the North San Joaquin Valley	Local Watershed Stewardship	Entire Bay-Delta Watershed	\$460,000.00
ERP-99-N18	Levee Setback Geomorphic Model	Local Watershed Stewardship	Entire Bay-Delta Watershed	\$104,458.00
ERP-01-N26	Lassen National Forest Watershed Stewardship Within the Anadromous Watersheds of Butte, Deer, and Mill Creeks	Local Watershed Stewardship	Sacramento	\$849,845.00
ERP-01-N28	Sacramento River Conservation Area Program	Local Watershed Stewardship	Sacramento	\$326,991.00
ERP-01-N31	Willow Slough Watershed Rangeland Stewardship Program	Local Watershed Stewardship	Sacramento	\$1,800,668.00
ERP-01-N62	Yuba Feather Work Group	Local Watershed Stewardship	Sacramento	\$193,650.00
ERP-00-E01	Last Chance Creek Watershed Restoration Project-- Ferris Meadow Reach--Feather River Coordinated Resource Management (FR-CRM)	Local Watershed Stewardship	Sacramento	\$1,009,400.00
ERP-00-E03	Cottonwood Creek Watershed Monitoring and Assessment	Local Watershed Stewardship	Sacramento	\$360,500.00
ERP-99-B15	Duncan/Long Canyon Paired - Watershed Project	Local Watershed Stewardship	Sacramento	\$86,108.00
ERP-99-N14	Colusa Basin Watershed Project	Local Watershed Stewardship	Sacramento	\$492,500.00
ERP-99-N16	Clear Creek Prescription	Local Watershed Stewardship	Sacramento	\$256,260.00
ERP-99-N17	Yuba Watershed Council	Local Watershed Stewardship	Sacramento	\$142,618.00
ERP-99-N19	American River (South and Middle Fork) Watershed Stewardship Project	Local Watershed Stewardship	Sacramento	\$203,250.00
ERP-99-N21	Development of a River corridor Management Plan for the Lower American River	Local Watershed Stewardship	Sacramento	\$250,000.00
ERP-98-E05	Cottonwood Creek Watershed Group Formation	Local Watershed Stewardship	Sacramento	\$161,000.00
ERP-98-E06	Battle Creek Watershed Stewardship	Local Watershed Stewardship	Sacramento	\$145,000.00
ERP-98-E10	South Yuba River Coordinated Watershed Management Plan	Local Watershed Stewardship	Sacramento	\$264,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-98-E13	Union School Slough Watershed Improvement Program	Local Watershed Stewardship	Sacramento	\$636,000.00
ERP-98-E14	American River Integrated Watershed Stewardship Strategy	Local Watershed Stewardship	Sacramento	\$220,750.00
ERP-98-E15	Sulphur Creek Coordinated Resource Management Planning Group	Local Watershed Stewardship	Sacramento	\$23,828.00
ERP-98-E16	Lower Putah Creek Watershed Stewardship Program	Local Watershed Stewardship	Sacramento	\$100,500.00
ERP-98-F01	Butte Creek Watershed Restoration Implementation	Local Watershed Stewardship	Sacramento	\$302,867.00
ERP-97-B01	Watershed Improvements/Sediment Stabilization (Deer, Mill, Antelope Creeks)	Local Watershed Stewardship	Sacramento	\$371,000.00
ERP-97-C03	Watershed Management Planning for Sacramento River Riparian Program	Local Watershed Stewardship	Sacramento	\$200,000.00
ERP-97-E01	Watershed Planning (Big Chico Creek)	Local Watershed Stewardship	Sacramento	\$422,830.00
ERP-97-E02	Watershed Planning (Deer Creek) - Implementation Program	Local Watershed Stewardship	Sacramento	\$196,554.00
ERP-96-M24	Butte Creek - Watershed Management Strategy Plan	Local Watershed Stewardship	Sacramento	\$83,000.00
ERP-96-M25	Battle Creek - Chinook Salmon & Establish Watershed Conservancy	Local Watershed Stewardship	Sacramento	\$50,000.00
ERP-00-E02	Panoche/Silver Creek Watershed Management/Action Plan	Local Watershed Stewardship	San Joaquin	\$873,440.00
ERP-00-E05	Merced River Corridor Restoration Project Phase III	Local Watershed Stewardship	San Joaquin	\$272,912.00
ERP-98-E09	Merced River Corridor Restoration Plan	Local Watershed Stewardship	San Joaquin	\$300,000.00
ERP-01-N01	The Influence of Flood Regimes, Vegetative and Geomorphic Structures on the Links between Aquatic & Terrestrial Systems	Natural Flow Regimes	Delta & East Side Tributaries	\$2,521,236.00
ERP-01-N02	Real-Time Flow Monitoring	Natural Flow Regimes	Sacramento	\$418,700.00
ERP-01-N05	Invasive Spartina Project (ISP)	Nonnative Invasive Species	Bay	\$1,793,661.00
ERP-00-F09	Treating Ballast Water Discharges at Existing Municipal Wastewater Treatment Plants	Nonnative Invasive Species	Bay	\$122,014.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-00-F10	Determining the Biological, Physical and Chemical Characteristics of Ballast Water Arriving in San Francisco Bay	Nonnative Invasive Species	Bay	\$387,182.00
ERP-97-C07	Preventing Exotic Introductions from Ballast Water	Nonnative Invasive Species	Bay	\$222,830.00
ERP-99-B18	Evaluation of Potential Impacts of Chinese Mitten crab on Benthic Communities in the Delta	Nonnative Invasive Species	Delta & East Side Tributaries	\$152,233.00
ERP-00-F11	Arundo Donax Eradication and Coordination	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$842,587.00
ERP-99-F05	Non-native Invasive Species Advisory Council	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$50,000.00
ERP-99-F06	Reducing Risk of Importation & Distribution on Non-native Invasive Species Through Outreach & Education	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$105,466.00
ERP-99-F07	Zebra Mussel Detection & Outreach Project	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$100,000.00
ERP-99-F08	Purple Loosestrife Prevention, Detection & Control in the Sac/SJ Delta & Associated Hydrologic Units	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$201,306.00
ERP-99-F09	Introduced Spartina Eradication Project	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$275,000.00
ERP-99-F10	Practical Guidebook to Prevent & Control for Non-native Invasive Plants in Shallow Water Habitats of the Bay-Delta Ecosystem	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$76,750.00
ERP-99-F11	Effects of Introduced Clams on the Food Supply of Bay-Delta Fishes	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$100,490.00
ERP-99-N09	Effects of Introduced Species of Zooplankton & Clams on the Bay-Delta Food Web	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$653,384.00
ERP-99-N10	Assessing Ecological & Economic Impacts of the Chinese Mitten Crab	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$113,033.00
ERP-99-N11	Purple Loosestrife Prevention, Detection & Control Actions for the Sacramento-San Joaquin River Delta System	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$127,473.00
ERP-96-M15	Introduction of Non-indigenous Aquatic Species Research Program	Nonnative Invasive Species	Entire Bay-Delta Watershed	\$197,000.00
ERP-01-N04	Arundo Donax: Survey and Eradication	Nonnative Invasive Species	Sacramento	\$360,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-00-F02	Canal Ranch Habitat Restoration Phase II	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$135,940.00
ERP-00-F06	Liberty Island Acquisition and Restoration Phase I	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$2,701,734.00
ERP-00-F07	McCormack-Williamson Tract Phase II Restoration Planning	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$365,650.00
ERP-00-F08	McCormack-Williamson Tract Phase II Monitoring Project	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$572,886.00
ERP-99-F04	McCormack-Williamson Tract Acquisition	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$5,356,000.00
ERP-98-F12	Stone Lakes NWR Land Acquisitions	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$2,622,500.00
ERP-97-B03	Liberty Island Acquisition	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$8,926,000.00
ERP-97-N14	Cosumnes Start-up Stewardship and Restoration	Restoration of Multiple Habitats	Delta & East Side Tributaries	\$1,985,100.00
ERP-99-N03	East Delta Habitat Corridor (Georgiana Slough)	Restoration of Multiple Habitats	Entire Bay-Delta Watershed	\$1,100,000.00
ERP-00-F03	Floodplain Acquisition and Subreach/Site-Specific Management Planning on the Sacramento River (Red Bluff to Colusa)	Restoration of Multiple Habitats	Sacramento	\$534,570.00
ERP-99-B09	Development of Implementation Plan for Lower Yuba River Anadromous Fish Habitat Restoration	Restoration of Multiple Habitats	Sacramento	\$3,000,000.00
ERP-98-F03	Butte Creek Acquisition and Riparian Restoration	Restoration of Multiple Habitats	Sacramento	\$125,000.00
ERP-98-F04	Lower Mill Creek Riparian Restoration (Phase I)	Restoration of Multiple Habitats	Sacramento	\$30,000.00
ERP-98-F18	Floodplain Acquisition, Management, and Monitoring on the Sacramento River	Restoration of Multiple Habitats	Sacramento	\$1,000,000.00
ERP-97-N02	Sacramento River Floodplain Acquisition - Natural Process Restoration	Restoration of Multiple Habitats	Sacramento	\$9,879,800.00
ERP-97-N03A	Sacramento River Floodplain Acquisition - Riparian Forest Restoration	Restoration of Multiple Habitats	Sacramento	\$780,000.00
ERP-97-N03B	Sacramento River Floodplain Acquisition and Riparian Restoration	Restoration of Multiple Habitats	Sacramento	\$512,500.00
ERP-97-N04	Sacramento River Meander Restoration	Restoration of Multiple Habitats	Sacramento	\$898,700.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-97-N05	Restoration Planning (M and N Fork American River, Auburn Ravine, Coon Creek)	Restoration of Multiple Habitats	Sacramento	\$222,530.00
ERP-96-M16	Sacramento River and Major Tributaries - Corridor Mapping Project	Restoration of Multiple Habitats	Sacramento	\$145,200.00
ERP-01-N08	San Joaquin River NWR Riparian Habitat Protection & Floodplain Restoration Project - Phase II	Restoration of Multiple Habitats	San Joaquin	\$7,646,233.00
ERP-97-B04	Acquisition and Restoration of Refuge lands (SJR NWR)	Restoration of Multiple Habitats	San Joaquin	\$10,827,000.00
ERP-97-B05	Bear Creek Floodplain Restoration Demonstration Project (SLNWR)	Restoration of Multiple Habitats	San Joaquin	\$334,000.00
ERP-99-F03	Habitat Restoration on McCormack-Williamson Levees	Riparian Habitat	Delta & East Side Tributaries	\$860,778.00
ERP-97-N13	Tyler Island Levee Protection and Habitat Restoration Pilot Project	Riparian Habitat	Delta & East Side Tributaries	\$885,202.00
ERP-96-M09	Project	Riparian Habitat	Tributaries	\$480,000.00
ERP-99-B12	Riparian Corridor Acquisition & Restoration Assessment	Riparian Habitat	Sacramento	\$2,240,250.00
ERP-99-N04	Lake Red Bluff Riparian Area Restoration & Education Support Project	Riparian Habitat	Sacramento	\$29,114.00
ERP-98-F20	Deer and Mill Creeks Acquisition and Enhancement	Riparian Habitat	Sacramento	\$1,000,000.00
ERP-98-F24	Butte Creek Riparian Restoration Demonstration	Riparian Habitat	Sacramento	\$76,348.00
ERP-97-N06	Butte Creek Acquisition and Riparian Restoration	Riparian Habitat	Sacramento	\$187,128.00
ERP-97-N08	Lower Mill Creek Riparian Restoration (Phase II)	Riparian Habitat	Sacramento	\$69,000.00
ERP-96-M03	Riparian Habitat Restoration Verona-Collinsville (Phase 1-Feas.)	Riparian Habitat	Sacramento	\$500,000.00
ERP-00-F04	A Mechanistic Approach to Riparian Restoration - San Joaquin Basin, Phase I & II	Riparian Habitat	San Joaquin	\$230,376.00
ERP-98-F07	Grayson River Ranch Perpetual Easement and Restoration	Riparian Habitat	San Joaquin	\$732,000.00
ERP-01-N14	Hill Slough West Habitat Restoration Demonstration Project, Phase II	Shallow Water Tidal and Marsh Habitat	Bay	\$87,000.00
ERP-01-N17	Suisun Marsh Property Acquisition & Habitat Restoration	Shallow Water Tidal and Marsh Habitat	Bay	\$536,750.00
ERP-01-N19	Ecological Monitoring of Tolay & Cullinan Ranch Tidal Wetlands Restoration	Shallow Water Tidal and Marsh Habitat	Bay	\$593,931.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-99-B11	South Napa River Tidal Slough & Floodplain Restoration Project	Shallow Water Tidal and Marsh Habitat	Bay	\$1,565,600.00
ERP-98-B13	South Napa River Wetlands Acquisition	Shallow Water Tidal and Marsh Habitat	Bay	\$1,073,513.00
ERP-98-C03	Hamilton Wetlands Restoration Planning	Shallow Water Tidal and Marsh Habitat	Bay	\$1,025,015.00
ERP-98-E03	Regional Wetlands Goals Project	Shallow Water Tidal and Marsh Habitat	Bay	\$76,000.00
ERP-98-F08	Hill Slough West Habitat Demonstration Project - Phase I	Shallow Water Tidal and Marsh Habitat	Bay	\$200,000.00
ERP-98-F13	Petaluma Marsh Expansion Project - Marin County	Shallow Water Tidal and Marsh Habitat	Bay	\$352,135.00
ERP-98-F14	South Napa River Wetlands Acquisition and Restoration Program	Shallow Water Tidal and Marsh Habitat	Bay	\$466,000.00
ERP-98-F17	Benicia Waterfront Marsh Restoration - Phase I	Shallow Water Tidal and Marsh Habitat	Bay	\$59,000.00
ERP-98-F22	Biological Restoration and Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone	Shallow Water Tidal and Marsh Habitat	Bay	\$772,667.00
ERP-98-F23	South Napa River Tidal Slough and Floodplain Restoration Project	Shallow Water Tidal and Marsh Habitat	Bay	\$1,490,000.00
ERP-97-N16	Bay Point Shoreline Restoration Plan	Shallow Water Tidal and Marsh Habitat	Bay	\$185,000.00
ERP-97-N18	Cullinan Ranch Restoration	Shallow Water Tidal and Marsh Habitat	Bay	\$368,500.00
ERP-97-N19	Tolay Creek Restoration	Shallow Water Tidal and Marsh Habitat	Bay	\$283,000.00
ERP-01-N13	Demonstration Project for the Protection and Enhancement of Delta In-Channel Islands (Phase 2: Construction & Monitoring)	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$928,150.00
ERP-01-N15	Fay Island Restoration Project, Phase I	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$744,148.00
ERP-01-N18	Feasibility Study of the Ecosystem & Water Quality Benefits Associated with Restoration of Franks Tract, Big Break, and Lower Sherman Lake	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$1,218,105.00
ERP-99-A02	Prospect Island Monitoring Project	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$915,000.00

CALFED ERP-Funded Projects Sorted by Topic, Region, and Year (1995-2001)

CALFED Project ID	Title	Topic	Region	Amount Awarded
ERP-99-B13	Understanding Tidal Marsh Restoration Processes & Patterns	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$1,042,246.00
ERP-98-A01	Prospect Island Habitat Protection Project	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$2,000,000.00
ERP-98-C01	Twitchell Island Subsidence Study	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$3,583,000.00
ERP-98-F16	Fern-Headreach Tidal Perennial Aquatic and Shaded River Aquatic Conservation Project	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$425,000.00
ERP-97-N12	Franks Tract Restoration	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$323,186.00
ERP-96-M02	Prospect Island - Shallow Water Habitat/Wetlands Restoration Plan	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$2,500,000.00
ERP-96-M10	Research to Predict Evolution of Restored Diked Wetlands	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$575,172.00
ERP-96-M26	Prospect Island - Develop Monitoring Plan	Shallow Water Tidal and Marsh Habitat	Delta & East Side Tributaries	\$35,000.00
ERP-01-N16	Butte Creek/Sanborn Slough Bifurcation Upgrade Project	Shallow Water Tidal and Marsh Habitat	Sacramento	\$1,000,000.00
ERP-99-N05	Reintroduction of Endangered Soft Bird's Beak to Restored Habitat	Special Status Species	Bay	\$178,889.00
ERP-01-N43	Genetic Identification of Watershed-Dependent Species of Special Concern in the Central Valley	Special Status Species	Entire Bay-Delta Watershed	\$851,669.00
ERP-01-N11		Special Status Species	San Joaquin	\$2,720,085.00
ERP-01-N23	Staten Island Acquisition	Uplands and Wildlife Friendly Agriculture	Delta & East Side Tributaries	\$35,110,873.00
ERP-97-N10	Jepson Prairie Restoration and Conservation Plan	Uplands and Wildlife Friendly Agriculture	Delta & East Side Tributaries	\$244,801.00
ERP-96-M06	Cosumnes River Preserve (Valensin Ranch Acquisition)	Uplands and Wildlife Friendly Agriculture	Delta & East Side Tributaries	\$1,500,000.00
ERP-01-N24	Battle Creek Riparian Protection	Uplands and Wildlife Friendly Agriculture	Sacramento	\$1,000,000.00
ERP-01-N25	Sustaining Agriculture and Wildlife Beyond the Riparian Corridor	Uplands and Wildlife Friendly Agriculture	Sacramento	\$1,464,167.00

APPENDIX C

Guidance Notes for Project Evaluation Exercise

GUIDANCE NOTES FOR PROJECTS EVALUATION 4/17/02

INTRODUCTION

The purpose of the ERP Projects Evaluation (also known as the Look Back Exercise) is to provide a summary of funded ERP projects. We are using a set of indicator variables to quantify the funded work in different areas (e.g., number of fish screens or acres of a given habitat type). For each project we will record the relevant information regarding these indicator variables. We also will tabulate how many projects addressed each of the strategic goals, strategic objectives, and uncertainties from the Strategic Plan for Ecosystem Restoration (Strategic Plan) and some additional information. Below is a description of the documents we will be working with and guidance regarding data collection.

PLEASE NOTE: We will first access project scopes from the contracts for data on each project. If they are not available, we will access project proposals. The project is looking at planned numbers for the ERP, and the scope provides the most accurate numbers for each project.

RELEVANT DOCUMENTS

- All project documents for the look-back exercise are located in the folder **ERP Project Folders** of the **Reference Library** of the eRoom.
- The working files and supporting materials in the **Task 2** folder of the **Work Area** are:
 1. **30kindicators.xls**—This is our working file. It contains three worksheets: (1) **project indicators**, (2) **goals and uncertainties**, and (3) **goals, obj, uncties, hab key**. Into the **project indicators** worksheet we will enter the summary statistics that describe each project's planned results. Into the **goals and uncertainties** worksheet we will enter the strategic goals, strategic objectives, and key uncertainties associated with each project. The **goals, obj, uncties, hab key** worksheet contains a brief description of the goals, objectives, and uncertainties for quick reference and a list of the habitat types that can be entered into the **project indicators** worksheet.
 2. **CALFED projects 29 March 02.xls**—For all CALFED projects, this file lists the proposal number and project number. Use the project number for tracking projects in the 30kindicators spreadsheet and not the proposal number. You will need the associated proposal number to access the original proposal on the CALFED web site.
 3. **12 opportunities.doc**—lists the 12 uncertainties and explains their meaning. It is useful for background reading/reference
 4. **Goals objectives descriptions.doc**—contains an explanation of all of the Strategic Plan goals and objectives for the **goals and uncertainties** worksheet in the **30Kindicators.xls** spreadsheet.
 5. **Project contacts list.xls**—lists points of contact and administrators for each project.

INFORMATION TO RECORD FOR EACH PROJECT

1. Record indicators and related information for each project.

For each project, in the **project indicators** worksheet of **30Kindicators.xls**, enter the project number (in column A), values for all appropriate indicators (in columns B–U), type of study (in column V), source of information (in column W), notes (where necessary, in column X), and any previous project identification numbers (in columns Y–AA).

- **INDICATORS**—In columns C and E are **Hab Types Acq** and **Habitat Types Rest**, into which go the habitat types corresponding to acreages in columns B (**Habitat Acq**) and D (**Habitat Rest**), respectively. A complete list of the habitat types is on the **goals, obj, uncties, hab key** worksheet in **30k indicators.xls**. Use these types only if the proposal or scope mentions them by name or you are certain that the project applies to the habitat type. If you cannot determine the type of habitat, leave the column blank and add a relevant note to your note section saying the habitat type was indeterminate based on the project documents. If you have a question regarding any of the indicators or a decision you are faced with, please post your question in the discussion area. If a topic does not already exist for the indicator involved, start a new topic the title of which is the task and indicator's name ("Task 2—Habitat Acq acres indicator" for example). This way answers will be available to others, which will improve our consistency and efficiency.
- **SOURCE OF INFORMATION**—Indicate whether the source of information was a proposal, contract (will likely be from the contract scope), quarterly report or final report. We will go to contract documents first for indicator, goals, objectives, and uncertainties information. If the contract is unavailable, go to the proposal. Generally do not go to reports because they may mix completed work with planned work. We are currently tracking only planned work.
- **NOTES**—Include notes on each project in the Notes **filed** (in column related to information or key numbers that are not within the indicators but may be relevant, especially if they occur in multiple projects. It is conceivable that a project does not necessarily fall into one of the indicators. If so, note what it is trying to do.
- **PREVIOUS PROJECT IDENTIFICATION NUMBERS**—Previous project IDs are for tracking various phases of a project. If a project is phased, try to indicate the previous project ID numbers when the project being reviewed is phase II or higher.

2. Record goals/objectives/uncertainties for each project.

For each project, in the **goals and uncertainties** worksheet of **30Kindicators.xls**, enter the project identification number (in column A) and the number of the goals/objectives/uncertainties associated with the project (columns B–L).

- Enter associated numbers for each goal/objective/uncertainty as indicated on the **goals, obj, uncties, hab key** worksheet of **30kindicators.xls**.
- There should be at least one objective for each goal listed.
- A project may have 1–4 goals or objectives associated with it. Assigning is generally a judgment call, but once you get to know the class of projects, it becomes easier. If you have a question about any decision you are faced with, please post your question in the discussion area. If a topic does not already exist for the goal, objective or uncertainty involved, start a new topic the title of which is the task and the name of the goal/objective/uncertainty (“Task 2—Goal 3.1,” for example). This way answers will be available to others, which will improve our consistency and efficiency.
- Unless specific target species are mentioned, it is difficult to assign goal 1, or its associated objective, to a project. However, many projects do mention target species, which assists in assignment.

ADDITIONAL GUIDANCE

Accessing Contracts and Proposals

- Contract scopes will be the primary source of information for planned information. These are available in the ERP project folders of the reference library of the eRoom.
- Proposals will be accessed when project scopes are unavailable. All are online in pdf format at http://calfed.water.ca.gov/ecosystem_rest.html under “access to all proposals.” Except for 2001 you will generally need to click on the year and then click on “all other 1998 (or whatever year you are accessing) proposals.” This will bring up a pdf file with access to the proposal numbers. Make sure you double check the proposal title with the number from the CALFED projects spreadsheet. Proposals also should be available in the projects database of the eRoom reference library.

QA/QC

- Each project reviewer teams with another reviewer. After they run through at least five projects from each year (1997–2001), they exchange their work, read through the associated proposals and make sure the numbers and assignment to goals/objectives and uncertainties are the same.
- So far, projects generally have taken about 1 hour or less to review, depending on their length and complexity. (In proposals most of the information is contained in the first 10–15 pages.). Most reviewers will see which sections are necessary to read after only a couple of contracts (or proposals, where necessary) have been read.

Summary for Each Class of Projects (2 paragraphs)

When each class of projects is completed, write up a 2-paragraph summary, including

1. sum of total numbers;
2. any pattern indicators or general notes from sheet one, especially numbers not tracked by the given set of indicators; and
3. patterns in goals, objectives, and uncertainties.

Project Level Review Interview Guide—5/9/02

Background

1. Tell me about how the project got started and its chronological history.

Fulfilling ecosystem restoration goals

1. What have project recipients completed compared to what is in the scope? What changed in the scope and why?
2. How were project objectives modified during the course of the project?
3. What problems/impediments did the proponents face and how did the proponents adjust?
4. What were the successes of the project?
5. **For listed salmon-related projects.** How many additional acres are available as a result of the project's restoration activities, and what activities has the project implemented that benefit listed salmon?

Project Learning

1. What are the key lessons you've learned from this project?
2. What procedural impediments were encountered while implementing the project?
3. What methodological and ecological challenges were encountered?
4. What data should be collected up-front before starting this kind of project?
5. How would you change the project if you had it to do over again?
6. What are the three things that most affect whether a project of this type is successful?

Cross-project learning

1. What mechanisms are in place for learning across your region and among similar projects?
2. What kinds of partnerships (if applicable) have worked? Which have not?
3. What other groups in the Bay-Delta do you communicate with regularly?

Experimental design

1. Describe the project's experimental design and methodology.
2. Is there a conceptual model? If so, how is it used for project implementation? If not, why not?
3. What restoration assumptions or hypotheses are being tested?
4. How is adaptive management being accomplished with the project (how are results leading to adaptation and learning)?

Monitoring

1. Did the project conduct pre- and postproject monitoring?
2. How are the monitoring data being analyzed, managed, interpreted, and shared?
3. What standard monitoring indicators would you suggest that would be useful across this project class?
4. What are the project's measures of success?
5. What standardized monitoring tools would you suggest?
6. If applicable, is there assistance you need with monitoring?

Results and communication

1. What kind of information has the project generated? What kinds of reports, graphs, maps, papers, and presentations has the project produced? Is it possible to share these?
2. Is this information useful for future ERP and ecosystem restoration decision making? Why?
3. What kinds of unexpected results have you gathered?
4. Is there assistance you need with any aspect of project implementation we have discussed (fulfilling goals, cross project learning, experimental design, monitoring, communication)?

Programmatic Review: Summary Factors

1. Total acres of habitat proposed for protection
2. Corresponding key habitat type proposed for protection
3. Total acres of habitat proposed for restoration
4. Corresponding key habitat type proposed for restoration
5. Miles of stream channel proposed for restoration
6. Total number of fish screens proposed/completed
7. Number of streams with increased screening
8. Total number of fish screens proposed
9. Total cubic feet per second screened
10. Total number of other fish passage structures proposed
11. Area of riparian corridor proposed for restoration/enhancement
12. Total acres of floodplain proposed for restoration or reconnected to river channel
13. Number of watershed groups formed/supported
14. Number of restoration plans developed
15. Amount of gravel enhancement proposed
16. Number of environmental education programs funded
17. Number of individuals targeted by environmental programs
18. Number of fishery assessments proposed to answer key uncertainties
19. Proposed fish response to restoration actions
20. Number of contaminants addressed
21. Number of nonnative species proposed for control
22. Number of locations (or acres, if available) proposed for invasive species reduction where reduction of invasive species proposed

APPENDIX D

Project-Specific Evaluations

TABLE OF CONTENTS

PROJECT ID	Project Title	Page
ERP-97-N21	KNIGHTS FERRY GRAVEL REPLENISHMENT	1
ERP-97-M08	TUOLUMNE RIVER SPECIAL RUN POOL 9 RESTORATION	4
ERP- 98-F15	LOWER CLEAR CREEK FLOODWAY RESTORATION PROJECT (PHASE II)	7
ERP-97-C11	GRAVEL AT BASSO BRIDGE	10
ERP-01-N06 ERP-98-F11 ERP-99-B05	REVISED PHASE 2 – MERCED RIVER SALMON HABITAT ENHANCEMENT: RIVER MILES 42–44 (ROBINSON RANCH SITE); PHASE 3 – MERCED RIVER SALMON HABITAT ENHANCEMENT: RIVER MILES 42–43.5 (ROBINSON RANCH AND GRAVEL MINING PERMIT #307 SITES); PHASE 1 – MERCED RIVER SALMON HABITAT ENHANCEMENT: RIVER MILES 40–40.5 (ROBINSON/GALLO PROJECT – RATZLAFF REACH SITE	13
ERP-96-M10	RESEARCH TO PREDICT EVOLUTION OF RESTORED DIKED WETLANDS (BREACH 1)	17
ERP-99-B13	UNDERSTANDING TIDAL MARSH RESTORATION PROCESSES AND PATTERNS: VALIDATING AND EXTENDING THE “BREACH” CONCEPTUAL MODEL	20
ERP-98-C03	HAMILTON WETLANDS RESTORATION PLANNING	23
ERP-97-N12	FRANKS TRACT STATE RECREATION AREA WETLANDS HABITAT RESTORATION	29
ERP-98-F23 ERP-99-B11	SOUTH NAPA RIVER TIDAL SLOUGH AND FLOODPLAIN RESTORATION PROJECT	31
ERP-97-N02 ERP-97-N03A ERP-97-N03B ERP-97-N04	SACRAMENTO RIVER FLOODPLAIN ACQUISITION – NATURAL PROCESS RESTORATION AND RIPARIAN FOREST RESTORATION, AND SACRAMENTO RIVER MEANDER RESTORATION	34
ERP-97-N14	COSUMNES START-UP STEWARDSHIP AND RESTORATION	38
ERP-96-M01	WESTERN CANAL WATER DISTRICT BUTTE CREEK FISH PASSAGE IMPROVEMENT PROJECT	42
ERP-97-M03	GORRILL DAM, FISH SCREEN AND LADDER	45
ERP-99-B02 ERP-01-N54	LOWER BUTTE CREEK, PHASE 2 AND 3	48
ERP-01-N16	BUTTE CREEK SANBORN SLOUGH BIFURCATION UPGRADE	52
ERP-97-N06 ERP-98-F-03 ERP-96-M24	CSU CHICO BUTTE CREEK ACQUISITION AND RIPARIAN RESTORATION, BUTTE CREEK WATERSHED MANAGEMENT STUDY	55
ERP-96-M21	ADAMS DAM FISH SCREEN AND LADDER	58
	BUTTE CREEK OVERVIEW SUMMARIES	61
	PROJECT LEVEL REVIEW INTERVIEWS	62

Knights Ferry Gravel Replenishment
Interview Date: 5/17/02

CALFED Project ID: ERP-97-N21

Contact: Carl Mesick, Carl Mesick Consultants

Contract Administrator: Jonathan Evans, National Fish and Wildlife Foundation

Interviewees (if different from Contact):

Type of Project: Channel Dynamics and Sediment Transport

Region: Stanislaus River, San Joaquin Basin

Background

Gravel and gold mining was intensive on the Stanislaus River between the mid-1850s and the 1970s. Much of the spawning habitat for fall-run chinook salmon was excavated as a result of these mining activities. The construction of upstream dams has greatly reduced the supply of gravel to downstream spawning areas. The cumulative effects of these changes have limited fall-run chinook salmon production in the Stanislaus River.

The goal of the Knights Ferry Gravel Replenishment Project was to improve the quantity and quality of spawning habitat for fall-run chinook salmon in the lower Stanislaus River. The evaluation of different methods of restoring spawning habitat was also an objective of the project, specifically whether the size and source of the enhancement gravel affects spawning use, and whether salmon prefer to spawn in areas where gravel is naturally deposited.

Project History

The National Fish and Wildlife Foundation executed the contract for this project with Carl Mesick Consultants in 1998. Permit applications were completed and submitted to regulatory agencies in the spring of 1999, and completed permits were sent to CALFED and NFWF in the summer of 1999. Project construction was completed by the end of September 1999.

A total of 13,000 tons of gravel was placed at 18 project sites in the Stanislaus River between Goodwin Dam and Oakdale. Six sites received a total of 4,490 tons of Stanislaus River rock ¼ to 5 inches in diameter; another six sites received a total of 5,570 tons of Stanislaus River rock 3/8 to 5 inches in diameter, and six other sites received a total of 2,940 tons of Tuolumne River rock 3/8 to 5 inches in diameter.

Lessons and learning to date

- This project was not a complete testing of the hypotheses regarding gravel size and source because the proponent was concerned with potential criticism by resource agencies and the public if the habitat was degraded by adding an unsuitable gravel. To minimize the concern, the proponent did not test gravel washed with a ½-inch screen (the Department of Fish and Game's preferred size) nor did they randomly select all of the treatments for each site.
- This project was not a complete testing of the hypotheses regarding the quality of salmon egg incubation habitat because rumors from senior agency biologists suggested that proposals with monitoring that exceeded 10% of the project costs would not be funded.
- This project has reintroduced only a small fraction of the gravel that was extracted from the Stanislaus River through mining activities.

- Based on results of this study, chinook salmon will immediately use spawning habitat if the proper gravel, bed configuration, and location are used. It is suggested that future spawning enhancement projects should focus on upstream riffles (with distance below a dam as the reference), native gravel, gravel mixtures that include 1/4-inch particles, and habitat shaped like the tail of a pool.
- Other studies and observations by professional fishing guides indicate that high densities of juvenile salmon and juvenile and adult steelhead/rainbow trout will immediately use these features.
- The source of gravel affected redd densities, with native gravel supporting significantly higher densities than out-of-basin gravel, particularly immediately following construction. “Seasoning” effects of out-of-basin gravel and large gravel were observed during the following year suggesting that spawning use might continue to increase with time. Another tendency, although not statistically concluded, was noted relative to gravel size.
- It was suggested that redd superimposition, low intragravel oxygen, groundwater upwelling indicated by elevated temperatures, and fine sediment deposition in the gravels during higher flows are important factors affecting egg survival in the Stanislaus River.

Project impediments/problems

- The monitoring that was approved was insufficient to test some of the hypotheses, as more sites were needed to detect statistically significant differences attributable to gravel source and size factors.
- There are a large number of factors that affect salmon egg survival and smolt escapement. It is difficult to conclusively test the numerous fluvial and biological factors that interplay to affect salmon success.
- There needs to be more communication with CALFED during the project to allow for adaptive management, particularly to make additions or quickly obtain additional funding to take advantage of opportunities as they arise.
- It was felt that CA Fish and Game, Region 4, did not see this project as a high priority with regard to permitting issues
- Local Stanislaus River gravel was hard to find.
- Restoration is felt to be restricted by the Reclamation Board, as they restricted the raising of flood water levels to one-tenth of a foot or less. This limits the amount of gravel that can be added to the river and the configuration of the spawning beds.

Information Exchange

- No CALFED staff have come to the project site or asked about the project.
- There has been no feedback either way with CALFED.
- The project proponent has made presentations to the CALFED Science Conference, American Fisheries Society - California-Nevada Chapter, Salmonid Restoration Federation, and the resource and consulting biologists working on the Stanislaus and Merced rivers.
- There is insufficient interproject communication across river basins; the project proponent relates this to “turf wars”.
- The project proponent feels that on-site communication and information exchange is critical to understanding both project results and establishing future investigation needs.
- It was felt that there needs to be more feedback during the proposal period, so that CALFED can better understand the investigative approach of the project. The Stanislaus River, with its

enormous reservoir storage and intensive instream mining, has unique problems and requires unique solutions.

- Oral presentations made by project proponents during the proposal review period, with feedback to the project proponent for improvement to enhance funding success, are recommended.
- Post-project presentations made to CALFED would be useful for both CALFED and the project proponent, and would improve chances of funding for subsequent proposals for the project type or target basin.

Available materials and documents

- Final report available from web.
- Ecological monitoring plan for the project.
- Task 4 construction report.
- Task 3 pre-project evaluation report.
- Task 5 initial post-project evaluation report.
- Task 6 second year post-project evaluation report.
- Quarterly reports.

Experimental Design and Monitoring

Testing the conceptual model that gravel replenishment will improve success of fall-run chinook salmon. Hypothesis testing was established, but confounding factors and funding limited monitoring to insufficient levels for rigorous statistical testing. This continues to be a problem for Phase II of this project.

Results/Successes

- This project demonstrated a successful design to restore habitat degraded by instream gravel mining and a lack of gravel recruitment. Restoration projects that include the recommended streambed configuration, gravel source, and gravel size should be used immediately by high densities of spawning chinook salmon, rearing juvenile salmonids, and adult steelhead trout in any Central Valley river.
- It was found that redd superimposition rates (salmon building redds on top of existing redds) were high in the Stanislaus River and that constructing new spawning habitat in the upper mined reaches might increase productivity by reducing spawner density.
- Further testing is needed to establish the pertinent fluvial and biological factors affecting spawning success and egg survival.

Tuolumne River Special Run Pool 9 Restoration
Interview Date: 5/21/02

CALFED Project ID: ERP-97-M08

Contact: Wilton Fryer, Turlock Irrigation District

Contract Administrator: Walt Hoyer, Metropolitan Water District
Cesar Blanco, US Fish and Wildlife Service AFRP

Interviewees (if different from Contact):

Type of Project: Channel Dynamics and Sediment Transport

Region: Tuolumne River, San Joaquin Basin

Background

The regulation of flow and the reduction of coarse sediment supply in the Tuolumne River by dams have changed the spawning habitat and river channel geometry. The Tuolumne river channel and floodplain have been further altered by agricultural practices (channelization and rip-rap), gold dredging (fragmentation, channelization, channel relocation), and gravel mining (channelization, degradation, the creation of abnormally large pools).

Gravel replenishment issues in the San Joaquin river tributaries predates CALFED by 40 years or more. Gravel additions had been done on the Tuolumne and Merced Rivers for some time, with successes for some projects and less so for others. These historical projects provide substantial experience to draw from for this project.

Project History

The Special Run Pool (SRP) 9 Restoration Project restores instream aquatic habitat and shaded riverine aquatic habitat, and reduces predatory fish (largemouth bass) habitat for the primary benefit of fall run Chinook salmon.

The project rebuilt a select portion of the Tuolumne River channel at river mile 25.9, which is approximately 15 miles east of Modesto. This is a location where past instream gravel mining created a large deep lake area in the main channel. This lentic habitat favors warmwater predator species including largemouth bass. This project returned this habitat back to its natural dynamic channel morphology. It has improved, restored and protected instream and riparian habitat for fall run Chinook salmon survival.

The river channel was reformed into a 400 to 500 foot wide riparian floodplain recreating a riffle and run pattern that follows the restored meander channel of the river along with native vegetation planted on fill terraces in a mix similar to that found on undisturbed segments of the river.

Lessons and learning to date

- After the construction bids were opened, they had to lower the design elevation of the floodplain by 3 feet in order for the project to stay within budget and meet the permit restrictions on time for in-channel work. This means that the floodplain will be inundated more frequently than originally expected. The primary fishery habitat and predator reduction goals of the project were not altered with the design change. CALFED didn't like the manner in which this design change was made because it didn't go through normal CALFED

channels. The time required to go through a formal CALFED amendment process would have required rebidding the project and a construction delay of one year. The design change was approved, however, by the US Fish and Wildlife Service.

- Weed control was an important lesson they learned in the process of floodplain revegetation. They tried multi-story plantings, but some of the forbs were affected by competition from weeds. Scheduling of the crew for hand weeding is a critical factor during initial weed growth periods. Other weed control methods should be considered as well to provide more flexibility in scheduling weeding crews.
- For streambank stabilization, they suggest that biostabilization methods may work better.
- If they had it to do over again, they would award separate revegetation and construction contracts because of timing between activities, flexibility in planting, and management of retainage funds. Seed gathering and growing of plants need to be started well before the construction and then they are planted and maintained after the construction is complete. CALFED contracts require 10% retention be held until the completion of the project, not substantial completion like other public works contracts. The retainage for the construction segment is much larger than the entire revegetation contract. Separation of the contracts would allow the project heavy construction proponent to receive the construction contract retainage, without waiting for the completion of the revegetation 1 to 2 years later.

Project impediments/problems

- A year was lost in the project schedule because of a delay in awarding the contract and in funding availability from the Metropolitan Water District. Administration of the MWD contract has since run smoothly.
- Adaptive management takes too much time to accomplish through the cumbersome CALFED channels. It is difficult to fit adaptive project changes into project time frames and ecological time windows.
- Permitting took a very long time, with the addition of 6 very complex permit conditions related to threatened and endangered species issues.
- Delays in awarding the contract, obtaining funding, and permitting resulted in the loss of two field seasons and consequently a two-year delay in schedule. This increased the cost for the project.

Information Exchange

- They have made presentations of the project at public meetings, HEC training sessions, project meetings and several symposia.
- No scientific papers have been prepared yet, as post-project data collection is not yet completed.
- They feel that the exchange of information is beneficial, particularly at the adaptive management meetings. The best forum for project communication so far has been the adaptive management workshop.
- The CALFED amendment subcommittee meetings do provide a means for CALFED to learn about projects. CALFED has never asked for a project presentation, however.

Available materials and documents

- There is no final report yet. They will await the post-project monitoring data. The final report will mostly have the fluvial geomorphology basic data, riparian habitat data, and bass population data.

- The Tuolumne River Technical Advisory Committee (TRTAC) prepared a 250-page Lower Tuolumne River habitat restoration plan document for development of projects, including SRP 9 (this project), along the lower 52 miles of the river.
- Project specific design and hydraulics reports were created.
- A comprehensive EA\EIS for the project developed the mitigation and monitoring plan for the project.
- A FERC Settlement Report EIS and FERC Order provide the background for development of the projects and summarize the prior 20 years of fishery related monitoring done by the Districts.
- There is a pre-project monitoring report that was prepared for the TRTAC and given to the adaptive management forum and a UC Davis peer review team.
- They will prepare a post-project monitoring report once data are collected and analyzed. However, the funding for this work is associated with the next project downstream, SRP 10.

Experimental Design and Monitoring

The lake habitat was filled with cobble from areas upstream and also from the Merced River. Topsoil from adjacent areas was used to restore riparian habitat on the newly formed floodway benches.

The primary objective is smolt survival. Two years of pre-project mark/recapture studies of smolts were conducted. There is no remaining SRP 9 funding for this monitoring under post project conditions nor is there assurance that test fish are available. The TRTAC is evaluating use of SRP 10 funding for this work. They will monitor largemouth bass populations in a pre- and post-project monitoring approach to determine if these predator populations have been reduced (through loss of lentic bass habitat). The first post-project bass sampling will occur this summer (2002).

Smolt survival will also be enhanced by higher velocities in the river channel, which will reduce smolt residence time in the river and consequent exposure time to predatory fishes.

The fluvial geomorphology monitoring plan has been completed, including the use of tracer gravel to measure gravel movement. Riparian inventories have been completed.

A 3-year CALFED contract is not long enough to provide for adequate monitoring to document success. There can be 1 to 2 years from the time a CALFED contract is awarded until actual construction on the project because of design, regulatory permits, and easement acquisition. This leaves no time for post project monitoring after the construction period. A longer time period is needed to follow the planting establishment in the revegetated floodplain and to document increased fish usage, given the typical variability seen in fish numbers. A 5-year contract period is recommended in order to see project success.

Results/Successes

- The project was built per specifications (with the floodplain design elevation change).
- They added microtopography elements to improve the project riparian habitat.
- They made field adjustments as appropriate and included them in the as-builts.
- It is still too early to judge project success, as the post-project monitoring has not yet been completed.

Lower Clear Creek Floodway Restoration Project (Phase II)
Interview Date: 6/6/02

CALFED Project ID: ERP-98-F15

Contact: Hide Wenham, Western Shasta Resource Conservation District

Contract Administrator: Michael Aceituno, U.S. Fish and Wildlife Service

Interviewees (if different from Contact):

Type of Project: Channel Dynamics and Sediment Transport

Region: Lower Clear Creek, Sacramento River Basin

Background

Habitat degradation in Lower Clear Creek has resulted primarily from gold dredging and gravel mining. Construction of two dams has disrupted streamflow patterns and significantly reduced the supply of gravel to downstream channels. This project was designed to restore a 1.9-mile reach (Mined Reach) where extensive instream gravel mining had occurred, and a 1.0-mile reach (Reading Bar Reach) containing dredging tailings.

At the Mined Reach, extensive gravel mining occurred both in the stream channel and in the floodplain. This resulted in the lost confinement of the natural stream channel, and the formation of multiple low-flow channels and large pits. The pits and the absence of a defined channel strands emigrating salmon smolts and reduces adult salmon migration.

At the Reading Bar Reach, tailings resulting from gold dredging were deposited in the floodplain, which dramatically confined the stream channel from the floodplain and reduced floodplain ecological functions.

Project History

The Lower Clear Creek Floodway Restoration Project is a four-phased project. This CALFED grant is for Phase 2, which is the largest of the phases, and consisted of reducing juvenile and adult salmon stranding in the Mined Reach and creating and revegetating a functional floodplain at Reading Bar Reach.

This Phase 2 project will restore functional floodplains and reduce salmonid stranding at Mined Reach by filling gravel pits with imported dredger tailings from Reading Bar Reach. Functional floodplains and off-channel wetlands will be revegetated at both reaches.

Phases 1 and 2 have been completed to date, and cost savings from Phase 2 are being used to begin a segment of Phase 3. Phase 3 is the largest phase and will focus on reconstructing and raising the bankfull channel above bedrock and hardpan. The proponent is just now finishing the first segment of Phase 3. Phase 4 has no funding, although it would have the greatest positive impact and benefits for fish habitat and stream channel reformation.

Lessons and learning to date

- At the start of this project in 1998, everyone thought that all four phases of the restoration would be funded by CALFED, because Clear Creek is a demonstration project for CALFED. Consequently it was felt that phases 3 and 4 would be funded. Proposals to CALFED to complete all final phases of the project have been rejected three times.

- The regional review board for the Phase 4 proposals concluded that Phase 4 was too costly, and that there was insufficient local support for the project. This has been frustrating because the cost per acre is less for this Phase 4 project than for similarly funded CALFED projects. It has also been frustrating because there is strong local support for the project through an extensive Lower Clear Creek Technical Work Group as well as the CRMP (a stakeholder group, the Lower Clear Creek Coordinated Resource Management and Planning Group). The project proponents were responsive to these regional review board comments, but CALFED funding was still denied.
- It is recommended that CALFED modify their proposal review process to include project proponent oral presentations to the review panel and/or board for all qualified proposal submittals. These presentations should include a question and answer segment as well, and the opportunity to follow up with responses to CALFED questions and comments following the presentation. This will allow CALFED to better understand and judge the proposals. There are too many proposals and too little time for CALFED to give thorough reviews to all proposals – oral presentations will help overcome this.
- There is generally a lack of communication with CALFED once the contract is started. This can be a problem in obtaining CALFED- approved changes such as those for monitoring. For instance, a year went by before hearing anything from CALFED regarding their review and possible approval of the project monitoring plan. Project construction had begun during that year of waiting, so the project contract administrator gave permission to go ahead with monitoring before review comments were received from CALFED. CALFED's review comments on the monitoring plan included some changes that differed from the monitoring employed during the year waiting period.
- The adaptive management workshop was quite helpful in fostering communication across projects and investigators. It is a good model for enhancing communication and learning.

Project impediments/problems

- The State Reclamation Board added 54 permit conditions in their initial review of the permit application. After 4 months of negotiation, those 54 conditions were reduced to 24 special permit conditions. This was both time consuming and frustrating.
- There were quite a few things that the Reclamation Board permit's special permit conditions took away from the overall project design. For instance, the Reclamation Board permit did not allow for planting elderberry in designated flow-ways – this has hurt the project because elderberry has good habitat value for bird species of concern and the project habitat for elderberry is good. Another problem was that the Reclamation Board permit didn't allow for any downed woody vegetation in the stream channel or floodplain, which necessitated a more complicated engineering approach for bank stabilization in the portion of the project that involved stream channel reconstruction. This added to the cost and time for the project.
- Regional water quality control board permitting was also a problem. The question of whether mercury was in the mining tailings was a potential issue. The mining tailings were to be used as fill material for floodplain restoration. At first, the WQCB would not allow the use of mining tailings, which was contrary to rulings by the WQCBs in other river basins for gravel enhancement projects. The project proponent completed a feasibility study of the tailings at Lower Clear Creek, and submitted it to the WQCB. The WQCB then ruled that the project could use mining tailings if they were screened and only material 1-inch or larger was used as fill. This increased the budget requirements and was a project impediment.

Information Exchange

- The adaptive management workshop was very useful, but it was a lot of technical material to cover and comprehend in one day of presentations (the first day was field trip)
- It is recommended that the adaptive management workshop be held a couple of times a year, and to make each one more specific (e.g. one workshop on geomorphology).
- Web-based communication would be a good way to distribute reports, and specifically oriented bulletin boards would be a good way to foster discussion and publicize project contact information for related projects.

Available materials and documents (USFWS has copies of these):

- Creation design document
- Geomorphic monitoring plan document
- Ecological monitoring plan document, including birds, fisheries, riparian vegetation
- The NEPA-CEQA document
- Lower Clear Creek watershed analysis, done prior to this project
- Delineation of waters and wetlands document (part of COE permit)
- Biological assessment done for phases 1-3 for ESA and CESA
- Video on project done with BLM monies (sent to proposal reviewers)
- Monitoring reports since 1997 are available.

Experimental Design and Monitoring

There was no monitoring included in the original proposal to CALFED. They received approval from the project's contract administrator (the US Fish and Wildlife Service) to use project contingency funding to support project monitoring. Funding will run out next year, and monitoring money will run out as well.

They conducted a lot of pre-project monitoring through CVPIA funding (including pre-project surveys, riparian bird and fisheries monitoring). BLM and USBR may be able to provide funding for continued bird monitoring.

Results/Successes

- Bird species monitoring shows that bird species of concern have been found in Clear Creek, and they have been able, through adaptive management, to improve the revegetation plan to further enhance habitat for these species
- Cooperation from all agencies is a success – it has developed and grown during the project. The working relationship is great.
- Salmon stranding numbers have decreased from pre-project numbers.
- More salmon spawning habitat now available; 51,000 tons of gravel have been added during the project.
- There are now a higher number of redds in areas where they added gravel through this project.
- The salmon population is 4.5 times higher than the levels in 1997; the goal was a twofold increase through project benefits.
- The BLM has been able to acquire all properties within project footprint.

Gravel at Basso Bridge
Interview Date: 6/6/02

CALFED Project ID: ERP-97-C11

Contact: Clarence Mayott, CA Dept. Fish and Game

Contract Administrator: Lauren Hastings, CALFED Bay-Delta Program

Interviewees (if different from Contact): Tim Heyne, CA Dept. Fish and Game

Type of Project: Channel Dynamics and Sediment Transport

Region: Tuolumne River, San Joaquin Basin

Background

The construction of La Grange Dam on the Tuolumne River resulted in the loss of coarse sediment supply (gravel and cobble) to the downstream reaches of the river. The loss of this gravel supply has resulted in the loss of gravel habitat in downstream reaches, with the resulting habitat being large cobble and armored bed surface. Any floodplain gravel supply to the downstream reaches has been lost with the construction of New Don Pedro Dam, which reduced large magnitude flooding events. Downstream channel incision has occurred in some locations as well because of the loss of a gravel supply.

Gravel replenishment in these rivers predates CALFED by 40 years or more. Gravel additions had been done on the Tuolumne and Merced Rivers for some time, with successes for some projects and less so for others. Gravel nevertheless did move through the river system after replenishment from these historical projects. These historical projects provided a lot of historical experience to draw from for this project, including three previous gravel additions on the Tuolumne River.

Project History

The actual gravel additions for this project were conducted during the summer of 1999. It took 3 weeks to add the gravel. About 12,500 cubic yards of gravel were added from the La Grange Dam downstream to Basso Bridge. Clean, appropriately-sized gravel was purchased from local sources for this project.

Lessons and Learning to Date

- Stream riffle uniformity is not desirable. Later projects are now adding flow and depth variability by adding “bumps”, which are bars created from instream or introduced gravel that go across the channel.
- The use of out-of-basin is a problematic issue because of gravel costs and the minimum bid issue. Testing it has been proposed, but CALFED didn’t fund the project. It may be an issue, but no one knows for sure.
- Enhanced interactions with CALFED would enhance the capability of project adaptive management. It is hoped that CALFED pays attention to the adaptive management workshop conclusions to change how they’re interacting with the programs. (e.g. enhanced monitoring suggested by CALFED versus funding for monitoring provided by CALFED).
- The project proponent suggests that someone needs to look at the interactive structure of CALFED, specifically how to streamline the number of meetings and the inability to be able to attend all of the meetings from a network communication perspective.

Project Impediments/Problems

- Contract signing was delayed to 1998.
- Permitting problems caused a delay as well, particularly given the narrow window of time during the year when it is permissible to work in the river because of salmon spawning. Permitting lags commonly occur with the COE, state lands permit, and the state reclamation board. Lags on this project may have been with the COE.
- Permitting lags seem to be a universal problem for these types of projects.

Information Exchange

- There are fairly active groups on all three San Joaquin tributary rivers, with fairly extensive cross-basin communication and interactions.
- However, there is not much formal communication.
- No presentations have been made on the project.
- There was little interaction with CALFED on the project.
- Enhanced projects interaction is desirable, both with CALFED and with other project investigators on a more formal front.

Available Materials and Documents

- Quarterly reports may be the only reports available.
- Video was made of gravel replenishment and of fish using area, - the Dept. of Fish and Game has the tape
- No final report was ever produced.
- The Department of Water Resources, as a subcontractor, did several reports on the physical monitoring aspects of this project.

Experimental Design and Monitoring

The Department of Water Resources did the physical monitoring of gravel movement (tracer gravel studies), pre- and post-project mapping surveys of stream morphology; gravel material supply based on pre-post comparisons, and modeling of stream hydraulics under as-built conditions.

Primary biological monitoring was to count redds (carcass surveys), live fish and redds observations during walk-throughs, and mapping of observational results.

The source of the gravel was gravel plant on Merced River; with a specified size mix with a size range was used. This was based on an accepted standard size and mix for gravel replenishment projects.

The gravel added at a location where spawning gravel had previously been located, but had moved out as a result of the 1997 flood (which had flows nearly ten times higher than the normal annual high flow).

Results/Successes

The gravel was put in a good location, and was good spawning material. The project as-built was close to design specifications (as per IFIM design ideals). The resulting channel was basically a wide, uniform channel with relatively uniform flows and water depths. It is now felt that more variable flows are key to salmon spawning success. Fish did spawn there, but less than

expected . The general notion is that they should have narrowed the channel to increase variability in flows, thereby providing faster flows. Avoiding uniformity a big learning lesson here. To some degree, they are trying to add gravel to river systems in several locations rather than in only one location to create flow variability.

The biologist at Fish and Game doing the stream alteration permit review for this project had worked on the Tuolumne in 1960s as a seasonal biologist doing the salmon carcass surveys in the 1960s. He felt that the gravel was too small based on his historical observations of the gravel present back when there were larger runs and fish on the Tuolumne.

Revised Phase 2 –Merced River Salmon Habitat Enhancement: River Mile 42-44 (Robinson Ranch Site); Phase 3 – Merced River Salmon Habitat Enhancement: River Miles 42-43.5 (Robinson Ranch and Gravel Mining Permit #307 Sites); Phase 1 – Merced River Salmon Habitat Enhancement: River Miles 40-40.5 (Robinson/Gallo Project – Ratzlaff Reach Site

Interview Date: 5/15/02

CALFED Project ID: ERP-01-N06; ERP-98-F11; ERP-99-B05

Contact: Richard Dixon, CA Dept. of Fish and Game.

Contract Administrator: Lauren Hastings, CALFED Bay-Delta Program

Interviewees (if different from Contact): Fred Jurick, CA Dept. of Fish and Game

Type of Project: Channel Dynamics and Sediment Transport

Region: Merced River, East San Joaquin Basin

Background

The latest project, ERP-01-N06, is reported here as it represented a culmination of project learning over the three projects on this four-mile stretch of river. All three projects were discussed in the interview.

This is the second of a three-phase project to restore a degraded four-mile section of the Merced River. The revised Phase 2 project is a full-scale implementation project based on a revised scope and budget from the original Phase 2 project proposal. The original proposal was scaled for a 1.5-mile section of the Merced River (river miles 42 to 43.5). It was collaboratively decided during the original Phase 2 project planning review that expansion of the scope and budget was justified and desirable, and the revised Phase 2 project and scope were developed. The revised Phase 2 project will restore a 2.0-mile river section (river miles 42 to 44). The project is commonly referred to as the Robinson Ranch site.

The primary objectives of the Phase 2 project are to improve upstream adult salmon passage, to improve downstream juvenile salmon survival, to restore spawning habitat dewatered in the 1997 flood, and to improve rearing habitat for juvenile salmon in a badly degraded section of the Merced River. Habitat degradation was primarily the result of mining activities and aggregation downstream of dams, flood damage, and pits in the river.

Adult salmon habitat is being improved by creating a functional stream channel that eliminates the shallow sheet flow habitat present during the spawning migration period. Juvenile survival will be enhanced by reducing contact with predator fish species. Smolts will move downstream faster through higher flows in the reconstructed stream channel, and predator populations will be reduced through the loss of their habitat when ponds are filled in. Spawning habitat will be improved by the recreation of a defined channel and addition of clean/sized gravel in the stream channel. The redesigned stream channel is designed to include spawning riffles, runs and pools. Bankfull flow of 1,700 cfs is expected. Floodplains will be restored with plantings of native riparian vegetation.

Project History

Manipulations of the river have led to the loss and degradation of native habitat. The building of dams has reduced access to spawning areas above dams and also reduced the supply of gravel in reaches below dams. Gravel mining has resulted in the formation of large in-stream ponds that provide habitat for fishes that are predatory on juvenile salmon. In the early 1990s, biologists identified several factors that are likely contributing to the decline of salmon in the Merced River. These factors include degraded stream habitat, poor gravel composition and recruitment, low flows, higher water temperatures, low intragravel oxygen content, predation on smolts by predatory fishes becoming established in the river, and insufficient spawning habitat.

Prior to the January 1997 flood, spawning surveys indicated that the original channel on the Robinson Ranch site supported up to 25% of the total Chinook salmon spawning activity on the Merced River and virtually all of the remaining spawning occurred upstream of this site. Aggregate mining activities, separated from the river by berms, occurred on the terraces adjacent to this area in the 1960s through the 1980s. Downstream from the Robinson site, earlier mining activities left a series of in-river and captured mining pits. Through the mid-1990s, there was significant anecdotal information which suggested this four mile reach created a serious impediment to juvenile downstream salmonid migrants. In addition to this anecdotal information, spawning surveys indicated that approximately 75% of all natural salmonid spawning occurred upstream of this site. Therefore, not only did hatchery reared salmon smolts have to negotiate the “black hole”, but so did a significant number of naturally spawned juveniles. The 1997 flood further complicated the previously degraded condition.

During the 1997 flood event, the berms that separated the river channel from the adjacent gravel pit failed, and the river channel changed and moved through the pond habitat in the gravel pit. Prime spawning habitat was now abandoned by the river channel, which now moved through lentic habitat ideal for predatory fish species. At least one of the sites created a sheet flow condition during upstream migration flows, which required emergency efforts by the DFG to dig a channel through the site to allow upstream passage for adult salmon.

Prior work on the Stanislaus River and Tuolumne River supported the need for habitat enhancements on this section of the Merced River to reduce predator fish populations and enhance spawning habitat and downstream smolt survival.

Lessons and Learning to Date

- It is too early to tell whether salmon populations are responding positively to the project enhancements. The monitoring plans are being prepared at this point.
- They are just starting the replanting in the floodplain restoration portion of this project. There are approximately 294 acres of floodplain to be restored.
- Approximately 1.5 million cubic yards of gravel have been manipulated to the restored stream channel, which is about 2 miles long. Gravel on site was redistributed to create 294 acres of gradual sloping floodplain while also conserving 27 acres of terrace farm ground.
- A CALFED liaison with regulatory agencies would be extremely useful, particularly the Corps of Engineers. It is felt that permitting would be smoother if a liaison functioned to provide the larger Bay-Delta perspective on specific project benefits.
- It was felt that regulatory agencies were not particularly well informed on the CALFED program. More outreach by CALFED or dialogue with these regulatory agencies would be beneficial in the permit review process.

- It makes some sense to combine final reports for this project and the other project phases on the Merced River. It is difficult to view progress and success on this project, particularly from a salmon perspective, when it is affected so directly by progress on adjacent projects on the Merced. The final report approach is still being worked out.

Project Impediments/Problems

- Threatened and endangered species issues in the permitting of the project required more time than anticipated to balance the needs of the various species potentially affected by the project.
- The issue of mitigation for wetland impacts in the permitting phase were initially difficult, because USACOE wetland criteria complicated a reasonable biological resolution of the 1997 flood damage to the site. To improve fish passage required resolving problems that caused significant sheet flow during spawning flows. The sheet flow was considered waters of the US under Corps criteria and therefore required mitigation. This was resolved only by taking into consideration that there was a total habitat benefit and the project was permitted under Nationwide #27 rather than a 404.
- The final report for this project is expected to be less scientifically rigorous than CALFED might desire. Statistical analyses and hypothesis testing may take years of data collection before they can be undertaken, given the inherent hydrologic and ecological variability encountered in measuring project success. The final report will likely have preliminary data and observations, rather than conclusions about the project.
- The short duration of CALFED funding for monitoring activities does not promote and allow for the development of a scientifically rigorous evaluation. However, one benefit inherent in the Merced project is that some aspects of monitoring within this reach were initiated reach-wide, with the first constructed Phase (Ratzlaff Reach) and will continue through the Robinson Reach Phase; and eventually through the final Phase(s) when funded/constructed. The combining of project monitoring funds should provide funding to monitor the entire 4-mile reach for 7-years or more.

Information Exchange

There has been active communication with similar projects on the Stanislaus River and Tuolumne River, as well as the Sacramento River and Clear Creek. Lessons learned from those projects helped develop the revised scope for this project.

The Ratzlaff project has provided valuable lessons for the Robinson Ranch site, particularly with floodplain restoration activities. The project proponents engaged in the Adaptive Management Forum on Large-scale Channel and Riverine Habitat Restoration Projects that provided significant opportunities for information exchange and learning.

Available Materials and Documents

- None aside from quarterly reports
- Engineering design report on SJD web site
- CEQA, NEPA, IS/EA reports
- Monitoring plan being prepared
- Post construction report being reviewed (now available 6/13/02)

Experimental Design and Monitoring

Geomorphic, fisheries, and floodplain vegetation monitoring plans are being developed. Redd counts will be made to indicate spawning activity, and capture/recapture tests will be made to indicate survival. There were no recaptures for the pre-project data set. Vegetative monitoring in the restored floodplain will be conducted over a five-year period, along with observations on bird and mammal use of the riparian habitat. Three riffle morphology treatments were implemented in response to discussions at the Adaptive Management Forum process, but monitoring funding for assessing these treatments is not in the original budget, thus creating a concern as to how these important experiments will be evaluated.

Results/Successes

It is too early to tell if project enhancements have provided improvements in spawning areas and smolt survival. It will take several years of varying flows to determine the extent of gravel movement downstream and the actual needs for replenishment in upstream areas. Floodplain restoration is too early to tell as well, as plantings are now underway. Channel reconfiguration appears to be a success, as does the removal of lentic habitat for predatory fish species.

Research to Predict Evolution of Restored Diked Wetlands (Breach 1)
Interview Date: 6/5/02

CALFED Project ID: ERP-96-M10

Contact: Charles Simenstad, University of Washington, Seattle, WA

Contract Administrator: Walt Hoye, Metropolitan Water District

Interviewees (if different from Contact):

Type of Project: Shallow Water Tidal and Marsh Habitat

Region: Sacramento – San Joaquin Delta

Background

This project is commonly referred to as BREACH I. It is one of the original CALFED-funded projects, and was funded by the Metropolitan Water District (MWD) of Southern California.

Over 90% of the tidal-freshwater wetlands in the Sacramento – San Joaquin Delta have been leveed and do longer incur inundation. This has resulted in declines of native fish populations and the primary productivity of the wetlands. A major goal of CALFED is to restore these once vast areas of tidal wetlands by breaching and removing the levees around delta islands.

The objective of this BREACH project is to generate quantitative predictions of the patterns and rates of restoration of these shallow marsh habitats with levee breaching, as well as the feasibility of restoring natural ecological processes and functions of tidal wetlands.

Project History

Investigative work on this research topic started before CALFED even had a standardized funding process. CALFED requested a proposal, and this project was funded in 1997. The project was started in 1997 as one of the first group of CALFED-funded projects. A funding supplement increased the budget to \$575,172. With the supplement, this project was extended into a 3.5-year effort. The supplement was to cover a late start because of MWD delays in starting, and to add one more season of sampling and to add another project partner for spring bird sampling in 2000. All sampling was completed in 2000.

The research approach was to use the varying ages of selected breached-levee sites to predict the patterns and rates of restoration that would be expected from levee breaching. The ecological status and functional processes of these sites were compared to remnant natural tidal wetlands to determine their progress along the path to restoration.

The research encompassed investigations on geomorphology, vegetation, macroinvertebrate, fish, food web linkages, and non-indigenous species characteristics of the reference and breached sites.

Lessons and learning to date

- Some of the breached sites had subsided up to 6 m during the time they were leveed.
- Restoration rates of breached areas depend largely on the degree of subsidence and the geomorphic region of the delta.
- Vegetation establishment through natural processes on deeply subsided, subtidal areas may take as long as several centuries because of the slow accretion of sediments and organic matter.
- Sediment accretion rates of ~4 cm/yr in subtidal wetlands and ~1 cm/yr in intertidal wetlands are predicted, depending on wave and current energy.
- Artificial means of accelerating sediment accretion, such as deposition of dredged materials, would accelerate vegetation development in these areas.
- Approximately 99% of the total fish catch in sampling (larval and juvenile fish) were introduced species. The density of native fish was highest at the Upper Mandeville Tip reference wetland site, related to both a cooler water temperature and conducive ecological conditions.
- Native tule marsh vegetation will rapidly colonize emerging intertidal elevations, but subtidal elevations will be dominated by submerged and floating aquatic vegetation, including introduced species such as water hyacinth and *Egeria*.

Project impediments/problems

- A delay in starting the project was caused by project initiation with the MWD. This was related to the lack of experience base in contracting (MWD was used to construction service contracts; the University of Washington was used to research grants such as those from the National Science Foundation).
- This delay was for a year, and necessitated extension of the contract.
- There should be landscape-scale integration across CALFED research and restoration projects so that data are both available and compatible.
- Recommends there should be a CALFED research PI meeting twice a year to foster cross-project communication.
- There were some challenges, such as how to sample SAV (submerged aquatic vegetation), but those challenges were met successfully.

Information Exchange

- Very little CALFED interaction once the project was approved. However, there wasn't really a CALFED research group at that time for active communication.
- Even today, there really isn't adequate cross project communication or learning opportunities.
- It's hard to integrate research across projects and proposals. Not sure whether anyone is really trying to get the "big picture" perspective, although efforts are now being made toward this.
- Presented at both the CALFED science conferences and the Interagency Ecological Program annual meetings, at regional American Fisheries Society meetings, at Estuarine Research Federation national meetings.

Available materials and documents

- Write-ups for both projects on web www.
- Final report submitted to the MWD in December 2001

- An interim report was completed in February 2000, available on the web at: <http://depts.washington.edu/calfed/breachin.pdf>
- Two Masters' theses evolved from this work (at University of Washington and San Francisco State University)
- Scientific papers: one has been submitted, but unsure of status.
- Publications list is on the web: <http://depts.washington.edu/calfed/bib.htm>
- The project web site is at <http://depts.washington.edu/calfed/calfed.htm>
- CALFED is preparing an online journal, and has asked for a paper on this project

Experimental Design and Monitoring

Space for time substitution was used, so you look at multiple sites at different stages of evolving restoration. Inventoried natural wetlands and breached wetlands in the delta area (the inventory was a deliverable). They selected 12 sites, including reference sites (relict wetlands) and breached (natural and intentional) sites.

Monitoring included vegetation surveys, geomorphological investigations, fish sampling, macroinvertebrates, and birds - as much as possible the same monitoring at all the sites. The analysis of the data is pretty descriptive, with measurements of sediment accretion rates using a variety of measurement techniques. The analysis was really a mixture of measured process data and descriptive data. The goal was to compare processes and ecological composition at sites with restoration age to ascertain how long it will take sites to achieve their restoration potential.

Results/Successes

This project was scaled for the Delta. CALFED later started asking questions about the Bay region. This project found out how critical subsidence is in affecting the rate of marsh restoration. Further, the project concluded that it may take many decades to a hundred years or more for restoration to occur in heavily subsided areas in the Delta region. This prompted the need to consider other strategies to accelerate the restoration process, or to decide not to attempt restoration of heavily subsided areas. Also, the process rates may be different further down in the Bay region where less subsidence is expected. This prompted continued research supported in the BREACH II project (EPD 99-B13).

**Understanding Tidal Marsh Restoration Processes and Patterns: Validating and
Extending the “Breach” Conceptual Model
Interview Date: 6/5/02**

CALFED Project ID: ERP-99-B13

Contact: Charles Simenstad, University of Washington, Seattle, WA

Contract Administrator: Diane Buzzard, US Bureau of Reclamation

Interviewees (if different from Contact):

Type of Project: Shallow Water Tidal and Marsh Habitat

Region: Multi-Regional

Background

In Suisun Bay, 79% of the tidal marsh had disappeared by 1988, most of it behind levees. Tidal wetland loss in the San Pablo/North Bay region has been 70%, although much of it has been converted to agricultural bayland. Restoration of a significant portion of these former tidal wetlands by breaching levees is a potential step toward recovery of the ecological integrity of the Bay/Delta ecosystem.

There continues to be a high degree of uncertainty and unpredictability, however, associated with reestablishing tidal wetlands through levee breaching. Given the extensive alterations in ecological structure and processes through complex management and manipulations of water, introductions of pollutants and non-indigenous species, and drastic declines in fish populations, there are many questions about the feasibility and practicality of tidal marsh restoration.

Project History

The project proponents have hypothesized that there are several significant differences among processes and structure along the Bay/Delta ecosystem continuum that would influence both rates and patterns of shallow water habitat restoration by levee breaching.

This project expands the original Breach 1 project (ERP-96-M10) from the Delta region to the Suisun Bay-San Pablo Bay region. A similar Breach approach will be used for this project as well, where they will use a “natural experiment” by using the diverse age distribution of naturally and intentionally breached levee sites in a “space for time substitution” to predict the patterns and rates of restoration that would be expected from levee breaching.

This project was funded in 1999, sampling began in the spring of 2001, and the project is still underway. The project is projected to be completed in 2003. Project funding is \$1,042,246. The final biological assessment sampling will be in April 2003.

There are five major tasks in the project:

Refine the Breach conceptual model for the Delta

- Extend the conceptual model to the Suisun bay and San Pablo/North Bay region
- Assess the relationship of fish, macroinvertebrates, and avifauna to restoration status
- Evaluate food web and other ecosystem linkages
- Prepare a synthesis document and presentations

Lessons and Learning to Date

- Fish sampling in marshes and flats is difficult for state fish agencies, but UWA has significant experience in this, so the marsh fish species list is surprising to some because it is showing some species that hadn't been documented before
- Fish sampling has been a learning process for the regulatory agencies involved in this project, as traditional sampling approaches had to be adapted to shallow marsh habitats. Consequently the fish species being collected in these habitats is surprising to some regulatory agency fisheries biologists.

Project Impediments/Problems

- It took quite a while (4-6 months) to establish the contract with USBR. This delayed testing of sampling equipment, and the onset of sampling.
- A centralized contracting approach might be a better, more efficient contracting approach to overcome these delays.
- One of the monitoring sites was near an U.S. Army site. After the September 11 terrorist attacks, access was temporarily shut down. This created some data gaps for that site compared to other monitoring sites.
- Hunters set fire to one of the marsh sites (a reference site). The project proponents had to chose a different site, and therefore had to throw out the data set for the original site.

Information Exchange

- No presentations yet.
- An IEP newsletter article on Breach 2 (see web site below).
- There is a general lack of communication across major projects, other than CALFED science conferences. Communication seems to be pretty much ad hoc
- A good model for enhancing communication is the National Science Foundation's LMER program (land margin ecosystem research). There were five research groups spread around the country, and once a year they all got together for information exchange, comparative research discussions, and discussions of future directions of the LMER. The LMER is now rolled into the LTER program.

Available Materials and Documents

- They have a Masters' student (San Francisco State University at Tiburon) on this project, so a Master's thesis will be a written product of this work.
- <http://depts.washington.edu/calfed/breachii.htm> is a web site for Breach2

Experimental Design and Monitoring

Similar to the design for Phase 1, where the project proponents are using a "natural experiment" by using the diverse age distribution of naturally and intentionally breached levee sites in a

“space for time substitution” to predict the patterns and rates of restoration that would be expected from levee breaching.

Results/Successes

- Restoration occurs at a much faster rate in the Bay region than in the Delta region
- This faster rate of restoration is likely attributable to circulation patterns and associated sediment resuspension, and because there is more sediment available.
- Lower subsidence seems to be the major factor in accelerated restoration in Bay area.
- In the case of this Breach 2 project, all sites are being sampled in parallel. This means that monitoring and sampling investigations of geomorphology, hydrology, sedimentology, fish, birds, invertebrates, and food webs are being done at all sites.
- In Breach 2, they incorporated two types of reference marshes: the ancient marshes (at least 1,000 years old) and the centennial marshes created more recently because of mining accumulations of sediments. They also have some marshes (not reference marshes) that are less than 10 years old.
- The number of fish being collected in shallow marsh habitat is surprisingly large, with higher percentages of native species than found in the Breach 1 Delta region.

Hamilton Wetlands Restoration Planning
Interview Date: 6/3/02

CALFED Project ID: ERP-98-C03

Contact: Tom Gandesbery, California Coastal Conservancy, Steve Goldbeck, San Francisco Bay Conservation and Development Commission (BCDC)

Contract Administrator:

Interviewees (if different from Contact):

Type of Project: Shallow water tidal and marsh habitat

Region: San Francisco Bay

Background and Project History

The project started in early 1990s based on several realizations that moved wetland conservationists towards large-scale restoration projects to accomplish their goals. At the same time, growing funds and support for that approach became available. The first realization was that trying to preserve postage stamp-sized wetlands and that regulatory permitting were not going to restore endangered species and the vitality of the wetland ecosystem, and that the health of the estuary was compromised by the loss of historic wetlands. The second realization was that there was an overabundance of dredge and dump materials in the San Francisco Bay and the associated establishment of a long-term management strategy for dredging spoils set up by the regulatory agencies to resolve that problem. A restoration study in the Bay area showed that Hamilton and Bel Marin Keys Unit 5 (BMK5, located just to the north of Hamilton) were the most feasible sites for utilizing dredge materials in the region. The third realization was the opportunity to participate in the Hamilton Army base closing. Originally it was proposed to become a local airport, but was voted down in several countywide elections and there was public support to restore the airfield back to the tidal wetland habitat.

The federal government has been trying to close the base since the middle of the 1980s and the runway area was the last part of Hamilton to be transferred. The State Coastal Conservancy had sponsored the Sonoma Baylands project, which is similar, in concept, to Hamilton. Supported by the USFWS, the Conservancy agreed to take the property through a no cost public conveyance.

The Conservancy granted funds to the City of Novato to carry out early planning and worked closely with environmental and other local interests to build support for the project. They worked closely with local stakeholders throughout the process, setting up the Hamilton Restoration Group comprised of agencies, consultants and local stakeholders. The project was evaluated by the Corps of Engineers for suitability under its beneficial reuse of dredged material program. This was the basis to go to Congress and gain approval under the Federal Water Resources Development Act (WRDA) in 1999. An EIS/EIR (Environmental Impact Statement / Environmental Impact Report) and Feasibility Study were completed in 1999. The original Hamilton plan contemplated expanding the project to the adjacent Bel Marin Keys property, a 1600-acre hay farm.

In 2001, the Conservancy purchased the BMK Unit V property for inclusion into the Hamilton project. The goal is to enlarge the Hamilton project, from about 800 acres to 2,400 acres. The Conservancy and Corps are still in the process of completing a draft supplemental EIS/EIR for the BMK5 parcel, due for release July 7, 2002. The Coastal Conservancy is managing the

contracts for the SEIS/R, while the Corps is preparing a feasibility report and other Corps internal process documents.

Initially, the proponents and their consultants put together a conceptual plan that was presented to the public, as well as a technical advisory committee/stakeholder group.

In 2000-2001 when the project proponents went into the final design and construction phase of the project, two major contamination issues were unresolved. There were low-level contaminants in the surficial soils in most areas of the site, and lead and other metals contamination has been found on the Antenna Field parcel, which has not been remediated. The Army has to clean up both sites (base closures are treated as Superfund sites) before transferring the land to the State Coastal Conservancy. Waiting on the Army to complete the cleanup has significantly delayed project construction and restoration. Proponents have received authorization to construct a pipeline to transport dredge material through the tidal marsh.

Funding. Efforts began with a grant to the City of Novato in 1996, prior to CALFED funding, with \$200,000 for pre-project feasibility and conceptual plans. The Conservancy applied for and received CALFED funding for the cost of the 1998 CEQA/NEPA documentation and a feasibility study. Project implementation funding for the state's cost-share comes from a 1999 State General Fund appropriation. The State must fund a 25% share of total project costs during the planning, engineering and design (PED) phase as well as the construction phase. On April 22, 2002, the Conservancy and the Corps signed the Project Cooperation Agreement, obligating the state funds to construction of the Hamilton project.

Restoration. The project will restore habitat that includes coastal salt marsh, seasonal wetlands, tidal channels and intertidal habitats. It will provide habitat for endangered species such as Chinook salmon, California clapper rail, brown pelican, California black rail and salt marsh harvest mouse. The restored wetlands will also support shorebirds and waterfowl migrating along the Pacific Flyway. The wetlands and associated habitats that will be restored are considered especially valuable because of the scarcity and declining amount of this habitat type in California and the dependence of listed threatened and endangered species on this unique resource.

More than 10 million cubic yards of dredged material is needed for the project. This material will come from navigation projects in the San Francisco Bay. The dredged material will be tested to ensure that it does not include contaminants at levels harmful to wetland species. Use of the material for wetlands restoration avoids the necessity of disposing it elsewhere in the Bay or in the ocean and consequently, wasting a resource that can be better used for habitat restoration.

A phased approach will be used to complete the design and construction tasks in conjunction with the availability of land and dredged material. Construction is expected to begin early the fall of 2002 and the site will receive dredged material for about six years. Initial geotechnical investigations to characterize soil properties began in late October 2001, as part of the Pre-construction Engineering and Design Phase of the project.

The project is multi-objective, having the goals of: wetland restoration; beneficial reuse of dredged sediment; and reuse of former military property. This project will be built on former

baylands that have are now at an elevation well below sea level, the elevation where salt marshes form. In order to raise the site back to a marsh elevation, clean dredged sediment will be imported to the site via a slurry pipeline. They have estimated they need 10.5 million cubic yards to get to the proper elevations.

The project proponents are utilizing the Sonoma Baylands immediately east of the Petaluma River as a model for the restoration approach. The Sonoma project showed that it is preferable to build a sizable transition from inboard levee, uplands, through seasonal wetlands to tidal wetlands, in order to provide for waterfowl and shorebird habitat and protect endangered species habitat. As a result they have designed large seasonal wetlands buffer areas for Hamilton. The Sonoma project also showed that restored lands should have a complete and stable connection to the open bay water in order to ensure good tidal exchange. A sizable breach between the open waters of the Bay and wetland has been designed into the Hamilton/BMKV project.

Project objectives/scope. The proponents haven't significantly changed the objectives of the project. They have amended the scope a little to accommodate project delays. The task 5 supplemental EIS/EIR final date was postponed and task 6, Hamilton Wetlands final plan, has new deliverable dates. Most of the project modifications have been made because of various environmental and process challenges associated with the project.

Lessons and learning to date

- This is a complex project that includes a diversity of stakeholders, challenges with toxic materials, working with different federal agencies, changing project personnel, differences in agency cultures and policies, and physical challenges such as sewer line across the property and flood impacts for Novato when dikes would be breached.
- Try to do project actions in parallel rather than sequentially.
- Take the long view on the project. It is easy during project discussions to go off on tangents. Repeatedly, issues arose where the project looked like it would collapse, but by working with the various stakeholders they have been able to continue to move forward.
- Need to have a lot of coordination between partners and supporters. Have to keep coalitions strong.
- Balance project design work and input from various stakeholders.
- Need federal contracting reform for project implementation.
- More peer review across projects is needed, bringing in outside expertise and lessons as guides, but without having them take over the project.
- Need a project manager's support group, where project managers from similar projects speak with each other about project successes, failures, and other learning.

Project impediments/Problems

Administrative / Permitting:

- **Base closure process.** Cleanup by the Army is on a slow schedule to complete. Base closure time frame expectations are much slower than the restoration effort. Staff involved in regulatory oversight have different motives and goals that do not temporally align with those of the project proponents, even though restoration is at the top of every agency's list of priorities. They are trying to fix this problem by resolving differences between the Department of Toxic Substances Control (DTSC) and the Army Forces command.

- The base closure process has taken resources (staff time and funding) away from project management. They have tried to facilitate discussions between all agencies and had two summit meetings during the summer of 2001 convened by the Corps. It's been hard to move forward and spend project monies with the uncertainty associated with the closure. This may translate into lost federal funding, (i.e. monies not spent and not carried over into the future).
- **Personnel turnover and institutional memory.** Steve Goldbeck is the only original manager left on the project. Having new people come in has created delays in moving forward on the project.
- **Corps evaluation tool for wetlands.** HEP (Habitat Evaluation Procedures) is a required procedure used by the Corps and is required by the US Fish and Wildlife Service (FWS) as well for wetland mitigation projects. HEP examines the relative habitat benefits of mitigation for certain species, but it assesses habitat value conceptually and has caused problems specific to this project for the proponents and agencies involved.
- **Changes in interpretations of regulatory requirements.** The FWS required a Biological Opinion (BO) for the Army cleanup and restoration; this BO would be phased and therefore wouldn't force the cleanup to wait for the project design to be finalized. The FWS staff on this project changed, and the BO was consequently changed to remove the phasing. This has resulted in further project delays.
- **Project management.** During the project the Corps has constructed excessively detailed project management schedules that were immediately rendered out of date because of project changes. Critical path designs are necessary but have not been developed because of the uncertainties surrounding the base cleanup. The Corps also did not have critical information available when it was needed for project design or permitting. The relationship with the Corps on the project has been good though.
- **Contracting.** The Corps contracting process has been very cumbersome and time consuming. Under the Corps project implementation, the state cannot do much of the contracting that needs to be done; this is a major problem. After the preliminary planning step, the Corps' policies do not allow the sponsor to undertake technical work. Also, if project proponents need to look at some technical aspect of the project, such as the depth of channel in relation to soils, they have to prepare a scope and the amendment process that can take months. Since the contracts have to be so carefully scripted, this further adds to delays. There needs to be a strict contracting process to follow, but not be so rigid that proponents can't do anything, resulting in projects becoming more expensive and time consuming.

Ecological / Environmental:

- **Contaminants.** Project site soils have low levels of DDT that are of concern if they become exposed to the future marsh environment. The erosion of contaminated sediments into the system could case a risk to listed clapper rail and black rail. The project design needs to take this potential sediment erosion into consideration.
- **Local level flooding and flood zoning.** The BMK5 site is in an area zoned for flood control, and regulations require a 4:1 set-aside if the site is "filled" with sediment material. Since the project would result in dredge fill, the State Coastal Conservancy (SCC) is required to get a change to flood control easements with approval by the County government. Flooding potential is important to the project proponents as well as local residents because the site is adjacent to housing located in the floodplain. The City of Novato and the local BMK community (unincorporated) have concerns about flooding and being affected by the wetland restoration project. The critical issue is how restoration efforts would affect potential flooding in the local area.

- **Access.** Bay trail and human access to the area needs to be balanced with endangered species habitat protection. The proponents are trying to address this in the project design.
- **Invasives.** Need to keep elevations of fill low enough so don't get weed invasions, such as pepperweed. Other areas will have saltwater, so that will limit weeds that are not tolerant to high salinity. Spartina has not yet been found in the north bay, but could potentially be a problem. There likely won't be any tidal action in the restoration for 8 years and BMK5 may not have tidal action for 15 years, although restoring areas in stages may shorten these projections. However, invasive species are already present, and the SCC will work to minimize populations of these invasive exotics in the interim that the BMKV project is being planned and constructed.

Information Exchange

Proponents have regularly communicated with all of the regulatory and resource agencies. Main communications are with: Department of the Army Forces Command, Department of Toxic Substances Control, Regional (DTSC) Water Quality Control Board, City of Novato, County of Marin, Marin County flood control districts, Novato Sanitary District and North Marin Community Water District.

Available materials and documents

- San Francisco Bay Joint venture: <http://sfbayjv.org/>
- Issue papers for congressional purposes have been put together for the project.
- Conservancy web site: <http://www.scc.ca.gov/>
- Corps web site: <http://www.spn.usace.army.mil/>
- Proponents have presented talks at BCDC and have presented at several conferences.

Experimental Design and Monitoring

They have a conceptual plan and model in Appendix A of the EIR/EIS. A hypothesis they are testing is related to the formation of a tidal channel network: if restoration gets the right elevation, then the tidal channel will form on its own and habitat diversity will increase.

The Corps has a requirement to put together an adaptive management plan for the site that continues for 13 years after initial on-site breaching. They have not yet designed an adaptive management plan but will do this as a part of the permitting package.

They have not yet done a concept model for seasonal wetlands, but this will be done as part of the final project design. Wetland restoration is an evolving discipline and the proponents are constantly learning from other wetland restoration projects.

In the tidal portion of the site they have looked at wave fetch, sedimentation, and erosion of the site. The issue is that wind generated waves in fetch areas can inhibit evolution and restoration of the marsh and in the extreme can flood neighbors by wave erosion on levees. As a result, they have looked at other marshes in the bay and come up with different designs for how to approach this. One approach features more internal peninsulas and another has fewer berms around the edge. They plan on trying both, coupled with monitoring to determine which works better.

Monitoring approach will be in the adaptive management plan and as part of permitting. They recommended having CALFED set up a monitoring database as a repository for project monitoring information so that the data are available to other projects in a standardized format.

Additional funds to conduct post-project monitoring are needed, as monitoring is currently underfunded for this project.

Additional data are needed on background levels of mercury contamination in the sediments, and baseline wetland conditions need to be determined to establish the benchmarks for the original tidal wetland.

Results / Successes

- Different areas of expertise and ideas for site restoration design and implementation were actively considered, largely through meetings. There are a lot of organizations and stakeholders that want to be involved and they have done a lot of outreach.
- The partnership between the State Coastal Conservancy and the BCDC has worked well. The two organizations may have different goals, mandates and perspectives, but have brought complementary skills to the table during the project and have done a “smashing” job of sharing project management. The two organizations have been far more potent and effective working together on the project than if they had worked separately.
- Environmental permitting and documentation, including the EIS/EIR and conceptual plans for the project, have been completed. The draft feasibility study is due out soon. The BMK feasibility study is complete.
- The best way to restore is to examine “real world” sites to see how they actually function. Consultants have gathered data at selected natural sites in the bay to see how they function.
- They have bought the BMK5 property and are starting restoration on that site.

Franks Tract State Recreation Area Wetlands Habitat Restoration
Interview Date: 6/6/02

CALFED Project ID: ERP-97-N12

Contact: Rick Roads, Moffatt and Nichol Engineers

Contract Administrator: Jonathan Evans, National Fish and Wildlife Foundation

Interviewees (if different from Contact):

Type of Project: Shallow Water Tidal and Marsh Habitat

Region: Delta region

Background

The Franks Tract State Recreation Area consists of two flooded, deeply subsided Delta tracts totaling about 3,300 acres. In 1990, the Department of Parks and Recreation contracted with Moffatt and Nichol Engineers to complete an engineering feasibility study. They recommended the construction of a number of islands to enhance the fish and wildlife resources of the area, to serve as wave barriers to protect levees of nearby islands, and to expand the area's recreational opportunities.

The present project was designed to construct four low islands in the flooded portion of Franks Tract, where existing water depths are typically about 10 feet at mean tide level. The project will restore approximately 45 acres of flooded subtidal habitat to 34 acres of tidal perennial aquatic habitat and 11 acres of shaded riverine aquatic habitat. Both are specific CALFED priority habitat types for restoration.

Project History

This project considers Phase 1 of the Franks Tract restoration. It includes the completion of the CEQA/NEPA environmental review and permit process, and the preparation of the Final Design and Construction Documents.

The basic principle of the project is to add dredged materials to deep areas to create shallow wetlands on four islands. Three of the islands would also provide wave protection benefits by being located contiguous to the existing perimeter levees of Bethel Island, basically reinforcing those existing levees.

This Phase 1 is still ongoing, with a scheduled completion the end of 2002. The proposals (two so far) for Phase 2 construction funding have been denied by CALFED so far because the project construction is so expensive for these heavily subsided areas.

Lessons and learning to date

- Expect a long contracting period with CALFED.
- Communication with CALFED is difficult in trying to understand where the program is headed and what might be funded down the road. At the time when the project proponents submitted for Phase 2 funding, CALFED said that they were looking for readily implementable projects, but they ended up funding research projects.

Project impediments/problems

- It took 18 months to finalize a contract with CALFED, creating a significant delay. Project work therefore didn't begin until January 1999.
- After about a year of work, they were just about ready to certify the environmental document when they incurred a new delay created because of an ecosystem roundtable member (also a resident of Bethel Island) who forced the issue of the need for a recreational component to the project. CALFED then agreed to amend the contract (more time and funding) to allow for raising parts of two of the islands to provide a recreational component for local residents. They are now revising the CEQA and NEPA documents to reflect the added recreational component designs.
- No permitting problems have been encountered, primarily because they had up-front permitting meetings that they felt prevented permitting delays.

Information Exchange

- Little interaction with other CALFED Bay-Delta projects.
- No knowledge of communication mechanisms – there really isn't a need for it with this project.
- No real contact with CALFED once contract was successfully begun.

Available materials and documents

- Quarterly reports submitted to NFWF.
- Design and environmental documents given to NFWF.
- CALFED was copied on earlier submittals to NFWF.
- They assume that later submittals are being given to CALFED by NFWF.
- No presentations or papers completed on this project.

Experimental Design and Monitoring

No monitoring for this project – it is a design and permitting project.

Results/Successes

This is an on-going design project. Things are now going smoothly since the addition of the recreational component to the project design. That was the only delay or problem once contracting with CALFED was completed.

South Napa River Tidal Slough and Floodplain Restoration Project
Interview Dates: 6/3 and 6/4/02

CALFED Project ID: ERP-98-F23, ERP-99-B11

Contact: Chris Gustin (new on project suggested John Wankum and Mark Joseph)

Contract Administrator: USFWS, USBR

Interviewees (if different from Contact): John Wankum, City Planner, formerly of City of American Canyon, and Mark Joseph, City Manager, City of American Canyon

Type of Project: Shallow water tidal and marsh habitat

Region: Bay

Phase I and Phase II are for \$3 million total.

Background/Project History

Interviewed John Wankum, who used to be the project manager, and Mark Joseph, the current City Manager. Since both are more from a planning background, the more scientific questions weren't fully addressed.

This project is located on the east bank of the Napa River between Vallejo and Napa. The project started in response to the CALFED Proposal Solicitation Package (PSP) in 1997. The consulting company ESA helped the City of American Canyon (CAC) put together a proposal for land acquisition and environmental review for 460 acres owned by the Port of Oakland as the first phase. They applied the following year for Phase II of the project, which will pay for the actual restoration and land improvements. The CAC offered 50 acres of their property that was used as sewage holding ponds. 85% of the restored land will go to the Department of Fish and Game (DFG) for management and the City will keep the remainder for a visitor center (paid for in Phase II) and possibly a recreation area in the future.

The project fit well with the CAC since it is a restoration grant and could enhance local wetlands. The property was being neglected by the Port of Oakland and its purchase by CAC fit into their general plan to build a greenbelt around the community and help act as an open space buffer. The City Council liked it since the CAC wasn't out of pocket, it enhances local wetlands/tidal action, and it provides some public access to provide a nice amenity to the community. Overall it was in keeping with City's environmental steward image they want to portray to the public.

The project has been completed up to Phase II and has recently submitted a project design and Environmental Impact Report, which are out for the 30-day review. The project has taken a little longer than expected (the project manager changed positions), but Mark thought they were within 1 year of completing the restoration work. The latter will consist of removing debris from the project site, breaching levees, breaching wastewater ponds, and construction of a visitor center. They will also relocate the sewage main near the holding ponds to avoid any line failures.

The project has changed very little from the original scope other than relocation of the visitor center site (original design had a bridge and footpath being built in wetlands, so they moved it to an upland area), and relocating the sewer main. Other differences were basic design changes made to fit the design plans to real on-the-ground conditions.

The project partners have been supportive of the project. The DFG has been a very supportive and cooperative player during the project. Napa and Vallejo Waste Management Authority (who operate an adjacent landfill) have both been supportive. The Army Corps of Engineers was the next most active partner after DFG, and has helped with flood control concerns. Both interviewees said they were impressed that state, federal and local agencies have worked so well together on the project without too many regulations and mandates.

Lessons

- Learning to work with different groups for buy-in. Holding pond as an example of something that was not environmentally benign, but input from various entities modified the project. State, federal and local agencies worked together to improve environment.
- Having enough public perspectives and policy interests at the table so issues are fleshed out for a sound project. Have to juggle the different conflicts of interest. Environmentalists wanted the public out of the restored area, but City Council and public want more public access. Have to have a bit of compromise on all sides.
- Having enough land (500 acres) to resolve conflicts or appease different interests is very important (see bullet #2).
- Never expect things to go as quickly as you think. Need to have someone there to push the project along.
- Different perceptions. The CAC thought the project dragged on but the US Bureau of Reclamation looked at it as one of their most successful projects.
- Mark said public amenities added were great, John said would have asked for more amenities together with more public input on those public amenities.
- People that represented the federal agencies should have one point person that represents the agency or each one should have more authority to approve facets of the project. They had to deal with multiple agency people.
- Other factors that affect success are proper funding, competent project management by the funding agency and implementers, good consultant selection, and an effective public involvement process. The latter was done but the City Council often didn't provide input when asked and then provided it later. They needed to have a general public meeting too.

Project Impediments/Problems

- Biggest impediment was the initial land acquisition, where they had to do 3-4 different appraisals. Each time they almost thought they were done and then had to do again. John said "...we weren't really aware of the property acquisition procedures of the federal government. It would have been helpful to have more information available up front." They lost quite a bit of time on this.
- Both mentioned that project has taken a long time, but that's nothing out of the ordinary for a large project like this. Mark mentioned that could have assigned one person to see the project through, but this is a minor impediment.

Information Exchange

There has been little information exchange. They did invite a lot of groups to participate in the project and comment on it; some participated and some didn't. They did a dedication of the land acquisition and will likely do another dedication when the visitor center is built and the restoration work is complete.

Available Materials and Documents

- “Wetlands deal finally official”. September 13, 2000. Vallejo Times-Herald.
- “Wetlands project dedication is Tuesday. September 25, 2000”. Vallejo Times-Herald.
- “Wetlands vision: Amcan celebrates ‘very special’ project”. September 27, 2000. Vallejo Times-Herald.
- “Another step forward for Amcan”. September 27, 2000. The Napa Valley Register.
- Environmental documentation
- Project reports

John said conceptual plans and available studies will be useful for ERP and ecosystem restoration.

Experimental Design and Monitoring

Assumption is that the project will improve the environment. Breaching levees will improve tidal wetlands (monitoring water quality and species composition before and after will help document this). Breaching levees will not cause flood damage to surrounding properties (analyzed by a computer model, which will be verified after the breach). Breaching levees will enhance wildlife (post project monitoring will document this). Monitoring plans are in place but who carries them out it still unresolved.

One area of concern was impacts to the salt marsh harvest mouse. This hasn’t been dealt with yet, and is under review by federal agencies. There is also a concern whether breaching levees would create a flood control problem for which they did an extensive hydrologic study. Consultants did extensive monitoring for environmental permits and documents. The project is not really set up to do research, test hypotheses or for adaptive management.

Results/Successes

- Purchasing the property from the Port of Oakland.
- Restoration enhancements for tidal wetlands (not yet complete but funded and expected to be done within one year).
- Environmental permitting and documenting.
- Getting different stakeholders input and buy-in.

**Sacramento River Floodplain Acquisition – Natural Process Restoration And Riparian
Forest Restoration, And Sacramento River Meander Restoration
Interview Date: 5/28/02**

CALFED Project ID: ERP-97-N02, ERP-97-N03A, ERP-97-N03B, ERP-97-N04

Contact: Dawit Zeleke, The Nature Conservancy

Contract Administrator: Gillian Harris, National Fish and Wildlife Foundation

Interviewees: Mike Roberts, Greg Golet, Dawit Zeleke, Ryan Luster, and Wendie Duron

Type of Project: Restoration of Multiple Habitats

Region: Sacramento River

Background/Project History

Projects grew out of a prioritization and planning process The Nature Conservancy (TNC) completed in the mid 1980s. Central Valley riparian habitat came out as a key ecosystem to focus on. The Sacramento River project covers from north of Colusa to Red Bluff.

The restoration efforts started as a mitigation project. Yellow-billed cuckoo and the Valley Elderberry Longhorn Beetle helped mandate the Sacramento wildlife refuge, which is managed by US Fish and Wildlife Service (FWS).

97N02—Was a block grant between FWS, Wildlife Conservation Board (WCB), and TNC to develop cooperative management approaches and to fund start-up stewardship or sub-reach planning. Project monies paid for hydraulic modeling, a geotechnical investigation on where to put set-back levees, acquisition and an attempt pull different conservation organizations together to implement projects on the river. \$9 million went to acquisition and ½ million to start-up stewardship. Acquisition has gone for approximately 2000 acres of 7 different parcels primarily focused in the Hamilton City area. Monies funded a whole host of other research cultural study, additional hydraulic modeling and a biological indicators investigation for bats and macroinvertebrates.

97N03—Monitoring project which arose from a seminar at Chico State

97N04—Flynn project restoration and acquisition. Allowed purchase of levees, , stewardship which paid for restoration planting and materials, and monitoring. 500 acres was purchased with these funds.

Partnered with Point Reyes Bird Observatory, FWS, DFG, WCB, local farmers, parks and recreation, DWR, counties, ACOE, Hamilton city community services district, SRCA and all of its members, US Army Corps of Engineers (USACE) and collaborated with the comprehensive study for modeling, restoration, and flood control is very important.

Lessons, Learning to Date

- Building stakeholder support is a big challenge and time consuming, but absolutely critical to long-term success. Building personal relationships is important, as is working closely with landowners and farmers on a daily basis. Involving local knowledge is crucial as well.
- On project N03 they would have focused more on understory restoration since some sites haven't come back on their own, with some sites having a weedy dominant understory several years into the project.

- Need to have a strong assessment of baseline conditions before starting a project including physical factors, e.g., hydrology and biological. Still have uncertainties in models so need to test those assumptions.
- Need to consider wildlife response rather than just vegetational response when restoring an area.
- Effect of exotics on the ecosystem. One hypothesis says where there are Argentina ants there is no VELB and they seeking funding to test that. Also didn't realize how strong nest predation from black rats and brown cow birds would be and how much that affects birds nesting near ground or shrub level.
- TNC needs/wants to work more closely with CALFED and meet on a more regular basis. They understand CALFED doesn't have the staff numbers, but more contact would certainly help for implementing projects and information exchange.
- They would like more contact with staff and the science program. A field based analysis/adaptive management program was suggested, which would be less formal than the adaptive management forum on Clear Creek, but with consistent follow-up and technical assistance.

Project Problems/Impediments/Challenges

- Project implementation and monitoring needs funding cycles longer than 3 years and funds available for research on larger ecosystems to better understand responses from a management standpoint. Three years also doesn't fit into a long-term ecosystem level time scale to monitor success at that scale.
- NFWF requires a lot of document review especially sub-contracts, which can slow projects down. NFWF, however is quick in responding and the people are great to work with, but it is the process that can be cumbersome. This happened with N02 where needed to have task orders fleshed out because of the open-ended nature of the contract. A review process for task orders wasn't set up at the time but is now in place.
- Length of time negotiating contracts—sometimes takes more than one year. Some work is seasonally dependent so can miss a whole season of work from contract delays.

Information Exchange

Primarily with local committees and groups such as the SRCA, CALFED science conferences, and Clear Creek Advisory Committee. They attended local/regional conferences.

Available Materials and Documents

- Map of project area including parcels purchased, restoration areas by TNC and all lands in conservation from Red Bluff to Colusa. TNC has more GIS coverages than this, such as locations of monitoring or soil core investigations.
- Paper published: Griggs, F., and G. Golet. 2002. Riparian valley oak (*Quercus lobata*) forest restoration on the Middle Sacramento River, California. USFS Gen. Tech. Rep. PSW-GTR-184.
- Sacramento River Project. Where we're going: Integrated floodplain management through sub-reach planning. The Nature Conservancy.
- Golet, G, et al. In press. Using science to evaluate restoration efforts and ecosystem health on the Sacramento River Project, California.

- Greco, S. 2000. Spatial modeling of episodic channel migration on the Sacramento River. CALFED Science Conference presentation.
- PRBO source-sink analysis and 1999 report. Additional annual reports.
- 97-NO2: Final Report. Two-dimensional hydraulic modeling of the upper Sacramento river, RM 194 to RM 202 Glenn and Butte Counties, CA. 2002.
- 97-NO2: final report. Pilot study of cottonwood recruitment on the Sacramento River.
- 97-NO2 Final report. Two-dimensional hydraulic modeling of rd 29 area.
- Beehive Bend sub-reach planning: Final report. Hydraulic modeling of beehive bend area.
- 97-NO2 draft report. Existing conditions report of cottonwood forest of the Sacramento River.
- 97-NO2 Final report. Geotechnical investigation of the Hamilton City area.
- Beehive Bend sub-reach planning. Various news letters as a part of outreach efforts
- 97N03: Restoration site plan, river vista VII restoration site, river vista unit.
- 97N04: Monitoring plan for CALFED restoration of 10 acres of riparian habitat.

Experimental Design and Monitoring

TNC is currently using adaptive management to guide their work, but feel they are just at the point where they feel they can do adaptive management right. We discussed how they have learned by a trial-and-error approach until recently, but this has allowed them to eliminate a lot of the noise in the system to the point where they can, for example, confidently plant trees in a specific spot, use less water and have a high success rate.

For hypothesis testing they are determining whether an ecosystem (both the physical and process components) can be restored on a large floodplain. Also are looking at what are all of the processes involved and how intensive the management at a broad system level scale.

Exotics have come out as a very high threat in the TNC Conservation by Design planning approach for the Sacramento River Project.

Results/Successes

- Flynn site where acquisition of a levee allowed TNC to retire a section of riprap along the river, begin restoration of natural meander processes, allowed USFWS to remove a private levee, and plant extensive tracts of riparian species from 3-5 years old (see pictures). TNC has significantly reduced the cost of planting and irrigation during their experience and learned much about what species to plant where, dependent on soils, hydrology, water table height, and surrounding remnant vegetation.
- Monitoring of birds by Point Reyes Bird Observatory has been crucial to project success . Other key successes at Flynn have been the increase in bank swallow population along the new cut of the river so that this is now the second largest population in the state, reduction of pesticide drift to the river, working with local landowners and agencies, and return of salmon redds to portions of the river where restoration occurred.
- After restoration planting, they saw yellow-billed cuckoo and then a few years later are seeing them nest. The same goes for valley elderberry longhorn beetle exit holes in elderberry bushes that appeared after planting, but later realizing that argentine ant invasions may prevent VELB success.
- Moved from planting all done by TNC staff to supporting a small restoration industry in the North Valley, which may even offset economical losses as a result of restoration. Have been

incorporating farmers and minority contract labor companies to conduct the restoration themselves rather than doing plantings with volunteers or TNC staff.

- Changing perception in community and getting folks to understand importance having a working river this includes all people in and near the region.
- Bringing agencies together is something the project has done very well. Getting DFG and FWS together has worked well too and has a framework on which to collaborate and focus on various issues.
- Making restoration cost effective. When started costs were as high as \$50,000/acre. Now is about 3k/acre to do full restoration in 3 years with under and over story.
- Cooperative land management agreement with FWS. Haven't had to spend a lot of time permitting since had the cooperative land mgmt agreement with FWS. Have also done work beyond what's required for permitting, e.g., floodplain modeling. TNC has helped FWS in environmental documentation and permitting process. Sacramento Wildlife Refuge has completed 2nd EA.
- Flynn is good example where riprap is gone, natural bank erosion returned there are new spawning beds and renewed invertebrate populations. Hasn't been quantified exactly how much area has been restored that will benefit listed salmonids, but TNC has done a lot under these projects that have indirect effects.
- bought mining rights under N02 that stopped a gravel mining project called the Clendenning property. 28,000 cubic yards previously mined is now going into the mainstem.
- Backwater areas along the river now surrounded by restoration that are significant rearing habitats for juveniles. Restored riparian forests will eventually provide more shaded riverine aquatic habitat and instream woody debris.

Cosumnes Start-Up Stewardship And Restoration
Interview Date: 5/17/02 (Ramona), 5/9/02 (Becky), and 5/24/02 (Lizbeth)

CALFED Project ID: ERP-97-N14

Contact: Ramona Swenson

Contract Administrator: NFWF

Interviewees (if different from Contact): Becky Waegell and Lizbeth Jacobsen

Type of Project: Restoration of multiple habitats

Region: Cosumnes River/Sacramento

Background/Project History

The Nature Conservancy (TNC) and Wildlife Conservation Board (WCB) were originally awarded \$7,185,100 to acquire, restore and adaptively manage properties in the floodplain of the Cosumnes River under 97-N14. The State Lands Commission contributed additional funds towards acquisition of one of the properties. According to the contract scope (6/15/99), \$1,958,100 of the award is for acquisition, restoration and stewardship of up to 6 properties along the Cosumnes River. The remaining \$5,200,000 of the award is covered under a separate scope of services and contract and destined for acquisition and restoration of the McCormack Williamson Tract.

The project had a very broad scope to allow flexibility in what parcels were purchased. TNC has already purchased two properties and will buy one more. One large property took up most of the funds and they have used the remaining funds to fill in with other properties. They wanted to focus on acquiring lands to create, restore and protect riparian habitat. Little has changed in the scope and project objectives.

Stewardship is focused on infrastructure improvements, such as replacing inadequate fencing, removing old buildings, installing new wells, installing or repairing irrigation systems, and capping old wells.

Restoration on the properties is focused on invasive species control and experimentation using BLM funds to see which plants would grow without intensive restoration efforts (e.g., irrigation). TNC has taken a small piece out of agriculture production (15 acres) and have modified the grazing program in the grassland areas to be less intensive.

TNC has a great working relationship with DFG and BLM. They have also partnered well with PRBO.

Lessons

- Project needs to have a 5-year funding period. The current 3-year time frame limits planning for research and conservation projects. Ecosystem responses cannot be seen in this time. They suggested a 10-year implementation period to see ecosystem level and restoration results.
- Build monitoring funds into the scope of acquisition projects. Acquisition, monitoring and stewardship costs will show the true cost of acquisition projects.
- Need to understand hydrology on site in addition to habitat for acquisition and restoration of riparian habitats. For instance, how does groundwater volume affect salmon?

- Acquisition funds have to be opportunistic given the time lag between funding, contracting, having funds available, and still meeting the goals of the project. TNC originally had different property in mind and had to be flexible since that property was no longer available when they received the funds.
- Need to have monitoring and time available to learn about a property. For example how it floods. It often takes longer than the 3-year time frame of CALFED project implementation to do this.
- Important to conduct acquisition and restoration projects at a landscape scale in order to come up with ecological function along the riparian corridor. TNC needs to have an understanding of the whole system including flooding, hydrology, and ecology especially so restoration projects are not just landscaping.
- Need to have the staff in place with skills necessary for implementation. Land acquisition is complicated so it helps when having knowledgeable people with experience in both the real estate and ecology. TNC had already worked in the area 10 years so experience in the region was strong and they had good rapport with neighbors. Some of the neighbors cooperated with putting instruments on properties so that was helpful.
- Coordinating with contract administrators and making sure they know restoration/ecology and are willing to help figure out problems is very useful.

Project Impediments/Problems/Challenges

- Contracting. Problems were primarily attributable to having to work with a public works construct and the State, NFWF and TNC had to figure out how to do this. This took one year and they subsequently had to ask for an extension to the grant.
- When doing infrastructure improvements and tearing down buildings, the disturbed habitat can quickly be invaded by invasives. Need to control them or will quickly have a problem.
- Trying to decide the best ecological outcome at each site is a challenge given the constraints, type of habitat, existing and past land uses. In some parcels they are trying to see what works with certain plantings such as elderberry, willow and oak.
- They need assistance with data management. This is particularly important now that the reserve is becoming more comprehensive. TNC needs a system that can be continually updated and the funding to design and manage such a system. They have depended on UCD and PRBO for much of the data management to date but not all of the parcels are covered by their work. This would also include determining the best methods for integrating data across the entire Cosumnes project.

Information Exchange

TNC is involved in many Delta issues and share information through various organizations and community of involved scientists at Cosumnes. TNC participate in the biannual state of the rivers conference. Ramona recently attended and presented on Cosumnes at the nationwide TNC science conference in Albuquerque so experiences and lessons were shared there, although focused on the reserve rather than the parcels of land funded by this project. There was a riparian and floodplain conference held in spring of 2002.

They have numerous tours through the Cosumnes River Preserve.

Available materials and documents

- Rangeland monitoring plan for Whaley and Denier properties. July 18, 2001.

- Conceptual riparian restoration plan for the Cosumnes River preserve: Castello Property and Laguna Creek. October 2000. May Consulting Services.
- Baseline monitoring for the Cosumnes River preserve: Shaw and Castello Riparian Forests. October 2000. May Consulting Services.
- Habitat mapping for the Cosumnes River preserve: Castello, Denier, Shaw and Whaley properties. October 2000. May Consulting Services.
- Special status species surveys for the Castello, Denier, Shaw and Whaley properties, Cosumnes River preserve. October 2000. May Consulting Services.

Experimental Design and Monitoring

Experimental design is not applicable to this project and no hypotheses had been formulated. They had not really captured conceptual models on paper but had them in mind, especially the importance of seasonal flooding. They recently did a concept model of the river for a biological audit on CALFED and non-CALFED properties.

They have not yet set up the project as an experiment, but are in early stages of developing possibilities. On Castello the parcel elevations won't allow flooding so the experimental design would be looking at what is the existing or potential hydrology of the site and selecting the best restoration tool. Also want to look at which species survive different planting designs and in relationship to the river and groundwater. On Denier 2 elevations are more appropriate for flooding and experimentation can focus on restoring natural flooding processes. Experimental design not paid for nor in scope of project.

They are using adaptive management in the rangeland management plan. In answering this question, Ramona mentioned they are first getting an idea of what the sites will become (in terms of restoration) at this stage. For example, they may try different treatments of planting at Castello with willows—augured plantings rather than pounding them into the ground. Another question they might want to answer is to how best to address invasive weed problems.

TNC conducted baseline biological surveys on all properties except Woods. They didn't do a survey in Woods since its value was upland habitat for Swainson's hawk (although the ecologists did a preliminary survey there). Conducted invasive species surveys on several of the properties to identify risks of invasions. Monitoring is through surveys, aerial photos, historical accounts of flooding, speaking with landowners and developing groundwater models.

They are in the process of determining monitoring priorities—e.g., what monitoring will be continued and how the monitoring will fit into TNC's objectives for the preserve. TNC does plan on conducting bird, grassland and riparian forest monitoring. Other organizations are conducting fish surveys. TNC would like to do follow-up baseline monitoring every five years. PRBO bird monitoring has been very useful and they have found some unexpected results such as a problem with black rat nest predation on riparian bird species.

Results/Successes

- Protecting key riparian habitats on the river.
- Protecting sandhill crane foraging habitats.
- Conducting baseline surveys on properties.
- Completing infrastructure improvements to aid in long-term management of the properties.

- Listed salmon—Protection of shaded riverine habitat and the replaced a low water crossing that was blocking salmon passage.

Western Canal Water District Butte Creek Fish Passage Improvement Project
Interview Date: 5/24/02

CALFED Project ID: ERP-96-M01

Contact: Ted Trimble, Western Canal Water District

Contract Administrator: MWD

Interviewees (if different from Contact):

Type of Project: Fish screen and Dam Removal (not technically a screen project since they decided to pass their diversion underneath Butte Creek)

Region: Butte Creek

Background and Project History

The Western Canal Water District (WCWD) had a main canal, which diverted Feather River water through the Oroville system to Butte Creek and a dam on Butte Creek to divert water across the Creek towards the western part of their district. During the drought of the early 1990s concerns were raised that diversions would adversely impact anadromous fish. Ted mentioned the case of Glenn Colusa Irrigation District who were shut down because of their diversion water's impact on anadromous fish. As a result, the WCWD decided to reduce their impact on anadromous fish in Butte Creek and thereby avoid endangered species impacts; the threat of Endangered Species Act (ESA) actions was a big motivating factor for the project.

The WCWD's existing dams on Butte Creek had fish ladders, but they were poorly designed by today's standards. The WCWD looked at the feasibility of installing screens and new ladders and realized they didn't have the proper approach and sweep velocities to carry fish. They decided the screens were not going to work and that an inverted siphon would be a more appropriate alternative.

Planning for the project started in the early 1990s, but Ted didn't know what happened from 1992-97 (the person who worked on the project at the time is deceased). The siphon construction, which was a competitive bid project, also funded the removal of four unscreened diversion dams. The inverted siphon consists of 3 sets of pipes, each 10-ft diameter and laid side by side. They are at the same elevation as the bottom of the canal, and go underneath Butte Creek to the other side where the canal continues.

Construction on the project began in 1997 and was completed by October 1997. Western Canal dams in Butte Creek mainstem, as well as McGowan and McPherrin Dams, were removed in 1998. Former Secretary of the Interior Bruce Babbitt dedicated the removal of McPherrin Dam on site in August 1998. The main dam in Butte Creek and a small ancillary dam upstream were removed in 1997. The project was completed under budget by \$329,419. Aside from monitoring and regulatory compliance the project is complete.

The scope of the project did not change much aside from minor changes in the design. They also had to dig some new canals and build lift stations to deliver water to people who lost their diversions from the dam removal.

All partnerships were successful. They partnered with FWS and MWD and CUWA funded the project.

Lessons

- Start early. If you want to do a project next year, you should have started 3 years ago.
- Keep to the task, scope and project at end. If you don't stand up for what's right and reasonable, agencies will run over you. They will require much more than necessary; you need to do your homework and have good consultants that can keep to task and limit agency demands that are outside the scope of the project.
- If everyone works cooperatively then something beneficial can happen that enhances agriculture and wildlife. They want and need to figure out more wildlife-friendly agriculture situations where both sides win. Have to have cooperation with agencies since they can draw lines in the sand that can stop a project.
- Projects need funding for all phases of their implementation. They had partial funds for post-project monitoring on elderberry, but those funds didn't cover all of the costs. Monitoring is for 10 years after the project and the funds only covered 5. So this has cost the water district about \$20,000 extra for mitigation and Ted expects they will have to pay \$40,000 over the course of ten years.
- It was frustrating that they were doing the project to help anadromous fish, but they were hit with mitigation for the valley elderberry longhorn beetle.

Project Impediments/Problems/Lessons

- Trying to get all the agencies, stakeholders and funders to agree on project design and implementation, and what to do to minimize and mitigate for environmental impacts from the project. It is hard to get agreement on listed species issues. Ted said there was a lot of unnecessary and wasted time related to this. But they worked through it during the scoping meetings.
- Environmental documentation was pretty expensive and required a lot of work on the water district's part to complete.
- Administratively they had to account for every cent expended on the project or they were not paid. Documentation of project expenses was overly detailed.
- They had some challenges with ESA issues and the valley elderberry longhorn beetle, where mitigation for the species has been costly. They also have been left with the responsibility for ensuring elderberry survival in order to comply with ESA requirements. So in the process of doing some good for fish, they had to remove some elderberry bushes. Removal of those bushes led to requirements for elderberry replanting and monitoring, which has been costly (approximately \$40K over 10 years).
- A fair amount of time was lost getting people to agree on how to do the project, even though it was easy to get them to agree on doing the project because of benefits to listed fish species.

Information Exchange

Spring run work group participation, water education foundation and Department of Fish and Game (DFG) tours to the site. Engineers have come out to examine the design of the project. They get a lot of people requesting to tour the project. They also communicate with Ducks Unlimited (DU) and Olen Zirkle. It's hard for them to communicate with extreme environmental groups but groups like California Waterfowl and DU work with people in the region to come up with solutions where everyone benefits.

Available Materials and Documents

They have done a lot of informal presentations, but Ted didn't know of any final reports. The project won the Roosevelt award for environmental excellence at the Association of California Water Agencies 1999 conference.

Experimental Design and Monitoring

Need to have monitoring to make sure the project succeeds or fails. DFG is doing fish counts for spring and fall run chinook. The project didn't have an experimental design.

They are doing monitoring of elderberry plants that is required for mitigation of the valley elderberry longhorn beetle. Thirty-four elderberries had to be removed during project construction, with concomitant 5:1 mitigation ratio and 60% success rate (after 10 years) mitigation requirements. They had to learn a lot about planting elderberry. They tried planting in rows and then in clusters, neither of which worked. They then moved plants to different soils and altered the irrigation method and that has been more successful.

Results and Successes

- **Benefits to salmonids**—Four dams were removed as a result of this project. This opened up approximately 18-20 miles of Butte Creek to salmonids. At ~200-300 feet wide, about 436-727 acres of potential habitat has been opened up to salmonids.
- **Agricultural land lost and protected**—Only a small amount of agricultural land (about 43 acres) was lost because of the project. Had the use of water for agriculture been lost because of a species take, then significant amounts of farmland would have been threatened (about 30,000 acres). More win-win situations like need to occur where species populations can be enhanced and farmers can continue to produce. **Endangered species protection**—Project shielded the district from anadromous fish impacts. The siphon isolated them from the creek and allowed them to maintain deliveries to growers while protecting fish. They have even improved water delivery and have water available to waterfowl and wetland management and with phasing out burning rice they are able to serve more growers with water.
- **Partnerships**—Created partnerships between WCWD and regulatory agencies to help in jeopardy and endangered species issues on other projects.
- **Water delivery**—they have more reliable water for their growers thanks to the siphon which also helped fish.

Gorrill Dam, Fish Screen and Ladder
Interview Date: 5/23/02

CALFED Project ID: ERP-97-M03

Contact: Jim Well, Ducks Unlimited, Inc.

Contract Administrator: Walt Hoye, MWD

Interviewees (if different from Contact): Neil Schild, Montgomery, Watson, Harza and Jim Well

Type of Project: Fish passage and exclusion

Region: Butte Creek

Background

Project was a design/implementation built in 98 and funded before many of the current CALFED requirements. Neither Neil nor Jim were there from the very beginning but it was a pretty straightforward design and build project. Landowner's representative, Don Heffren, at the time of the project is now deceased, although Nancy Piret is the treasurer of the Board of Directors for Gorrill Land Company and may be able to provide any additional historical details (tel: 530 342-6867).

Some interesting lessons about how CALFED is much more complicated now with more requirements that can make project work and implementation more difficult. Jim seemed to think that many of the new contracting requirements placed by DWR, NFWF etc. aren't necessary and ask too much of proponents. Both mentioned that patience and flexibility were key and having a group of people that collaborated helped make sure that the project was completed. Project overall went very well because of a cooperative land manager who has continued to stay engaged (original manager is deceased) and who paid for some modifications in the project structure once they got underway.

Talked about projects still to do in Butte Sink, which are mostly now on the lower part of Butte Creek. Both agreed that projects in the region compose a model system level project and that you have to take into account all diverters to get the improved passage and reduced entrainment effects for fish.

Project History

Ducks Unlimited (DU) came into the project in January of 1997, construction took place in June/July 97 and project was put into operation in 1998.

Agencies put out the word that diverters would be scrutinized and that CALFED had funding. They started with putting in a fish screen at Parrot Phelan. Western Canal Water District wanted to stop diverting water from Butte Creek. In 1997, Durham Mutual Water Company installed a screen and in the same year Rancho Esquan installed screens on their diversions. After that Gorrill started their project, followed by the removal of McFerrin and Parrot Phelan Dams in the Upper Butte Creek area. McFerrin was the dam removal at which former Secretary Babbitt wielded a sledgehammer.

Gorrill Land Company decided that Ducks Unlimited (DU) should be the lead on the project as a non-profit, for tax issues. The project is completed.

There were minor changes made to the scope that cropped up during construction. These changes could not have been anticipated, such as dealing with the old dam where they had to put an overlay on it to improve the foundation. These minor changes didn't cause any delays and didn't require additional funding.

This was a design/build project, which shortens the time involved to implement the project. They were able to obtain the permits and move to construction in one season. To obtain permits you have to have a lot of patience. They started addressing permitting about 6-7 months beforehand and had to push to get them in on time. Contractor was able to go in quicker but they were held to the June 15 date.

Lessons and Learning to Date

- Cooperation and good communication between landowner, agencies, stakeholders, consultants and contractors was critical to project success.
- Commitment of Gorrill Land Company to the project was critical. This has helped with post project maintenance and monitoring. Their good relationship with Montgomery, Watson, Harza (MWH) has helped since their engineers train (at no cost) new GLC employees on operation of the ladders and screens when there are staff changes.
- If the structures built are complicated, then the owner won't maintain and operate them.
- Agency folks can make or break projects from a cost or workability standpoint. If they're not flexible, won't listen to facts, or they steer the project to their way of thinking, then projects can become economically infeasible and hard feelings are created.
- The expertise of MWH engineers helped. At Rancho Esquan they built a roughened chute passage system which the engineers at Gorrill decided would not work. The system at Esquan is still not operating correctly with monitoring showing that the velocities are not within correct tolerances for passing fish. Gorrill put in a vertical slot ladder, which is a self-cleaning device and is graded so velocities do not run too high.
- Need to build flexibility into a project. There are often additional project costs that are not much beyond the funded scope, but the contract amendment procedure make it cumbersome to request additional funds. For example, the landowner paid the additional costs to cover the entire screen and ladder to prevent liability problems.
- The way the screen was designed, the back wall a little too close to the panel. This was corrected by putting a baffle in the lower half. The end result was an economical solution.

Project Impediments/Problems

- Contract administrators (jumped from MWD to CUWA) at the beginning of the project kept changing the ground rules such as the hydraulic evaluation and the O&M manual requirements. Each change resulted in a new set of rules.
- The CVPIA came out with more stringent guidelines for monitoring, to which MWH and DU protested since the new monitoring requirements would cost more than the original scope and proposal. CVPIA relented and allowed the original monitoring plan.
- Contracting took quite a while. Gorrill Land Company received the grant in fall 1997, and the contract was signed June 1998. This caused delays in project implementation. Stream work occurred only during a set time period, and they barely met that date because of contracting and permitting delays.
- The project would take a lot more coordination if it were to occur today, since there are more regulatory people involved and it's more difficult to come to agreements.

Information Exchange

They have had quite a few informal tours to the property to see the ladders and screens. Most of this has been done by word of mouth. Land manager was on the Western Canal Water District Board so was able to convince many other landowners this was a good thing to do. MWH took clients there. The project turned out to be a showcase.

Neil made a presentation on Gorrill to the American Fisheries Society in March 1999.

Available Materials and Documents

- None aside from project deliverables
- Photos of fish screens and ladders at www.iep.water.ca.gov/cvffrt/gorrill.htm

Experimental Design and Monitoring

There was no experimental design, as this was a design and build project. The only monitoring that was done was for fish passage and standard ladder and screen criteria. DFG does continue to monitor fish in the area, but that is separate from the project. They had to make some minor adjustments after construction, but the criteria were met. Post-monitoring to meet criteria was just one day. Jim felt that some of the monitoring hoops make projects more costly and difficult to implement. He thought on simple, but well designed, projects many of these requirements are unnecessary.

Need to collect flow data and fish behavioral data up front to best design the passage structures. They were fortunate in that Neil was at the ranch in 1997 during the flood and when Gorrill started construction M&T pumps project had completed and they were able to learn from that design and construction.

Results/Successes

- Provided fish passage and safe out migration, passage both ways and screened supply so saved fish from going out into the fields.
- Cooperative effort between landowner, agency, non-profit and consultant that worked out for everyone. It was a showcase, well done, looks good, many other water agencies have come to use it as a model, and it has been toured by many groups.

Lower Butte Creek, Phase 2 and 3
Interview Date: 5/6/02

CALFED Project ID: ERP-99-B02, ERP-01-N54

Contact: Olen Zirkle

Contract Administrator: NFWF, USBR

Interviewees (if different from Contact):

Type of Project: Fish passage and screen

Region: Butte Creek

Background and Project History

Lower Butte Creek, Phases 2 and 3, is part of the Lower Butte Creek Project, which is a cooperative project bringing together a diverse group of stakeholders, agencies and related entities. Their goal is to work out mutually beneficial fisheries upgrades to the water control structures and diversions located within Butte Sink, Butte Slough and Sutter Bypass reaches of lower Butte Creek. The Project is designed to assist the recovery and reverse downward population trends of spring-run and winter-run chinook salmon, steelhead and splittail in Lower Butte Creek. The project will construct fish ladders and screens to increase fish passage and reduce mortality of juvenile out-migrants.

Phase 1 of the project was primarily focused on environmental documentation. Phase 2 included environmental documentation, permitting and project design. Phase 3 is construction of the designed structures. Phase 3 was funded from the 2001 PSP and construction will start in summer 2002 and finish over a two-year period. Construction will take place at Weirs #3 and #5 and the East-West Diversion Weir.

Lessons

- They are in the process of applying lessons learned from this project and others in Butte Sink to see what is applicable to other regions such as the San Joaquin, and seeing if similar processes can be used elsewhere.
- Focus groups on agriculture water quality objectives have worked well and guided future activities in the project. The scope changed dramatically from holding general workshops on water quality to developing a brochure and implementing a water quality demonstration project. Focus groups allowed the participants to air concerns in a safe environment.
- Facilitating processes like this can cost \$250,000/year for salaries, facilitation costs and developing a report.

Project Impediments/Problems/Challenges

- The biggest challenge was the large number of stakeholders involved, although this was both a challenge and success of the project. Varying agendas were common for the stakeholders, which included agencies, hunting club owners, refuge managers, water districts, farmers and landowners. For Butte Sink there are 22 club owners and 5 agencies (DFG, FWS, NMFS, DWR, and USBR) and they had to reach agreement on design and operation of the fish passage structures. The stakeholders wanted a minimum of regulatory oversight and the agencies wanted maximum regulatory oversight, and Ducks Unlimited had to find the middle ground for agreement.

- The biggest stumbling block was coming to agreement on the kinds of construction they would implement. For example, some of the agencies questioned whether the upgrades to some of the weirs would have any impact on the fish.
- The final stumbling block was to work out an operation plan that is both site specific, but considers cumulative impacts for the entire Sink.
- It was originally estimated that it would take 18 months for the group to come to agreement on the project, but it took 3 years

Information Exchange

Meeting attendance at:

- Spring-run Work Group;
- Northern California Water Forum (NCWF); and
- Sacramento River Conservation Area (whenever there are issues regarding fish screens).

Olen has given a presentation to the NCWF and the spring-run work group. He also attends the California Waterfowls Association annual meetings and other stakeholder group meetings as appropriate.

Available Materials and Key Documents

- Valley Bay CARE, Ducks Unlimited Newsletter, Issue No. 30, Fall 2001. Lower Butte Creek: Signs of Recovery. Photo and short paragraph on lower Butte Creek.
- Powerpoint document with photos of structures and weirs in the project.
- Butte Sink Cooperative Management Plan. 2001. Prepared for California Waterfowl Association by Jones and Stokes.
- Lower Butte Creek project phase 1b final task report: Task 2: Evaluation of fish passage conditions in Butte Sink. 1999. Prepared for DU, CWA and FWS by JSA.
- Upper and lower Butte Sink water control structure upgrades: Mitigated negative declaration, FONSI, and Initial Study/EA draft. Jones and Stokes.
- Three part series of articles published in the Chico Enterprise, 11/24-11/26/02. Saving salmon: Strengthening Butte Creek spring-run likely to cost \$50 million, Saving Salmon: Fixing the sink is the second phase of Butte Creek restoration, Saving Salmon: Not much more can be done in Butte Creek canyon.
- Map of diversion structures in the Butte Sink, Butte Slough and Sutter Bypass.

Experimental Design and Monitoring

Conceptual model (from proposal): The elimination or modification of irrigation dams and diversions will restore access to natal holding and spawning areas, and contribute to the recovery of federally and state listed anadromous fish populations in Butte Creek.

Hypotheses (from proposal): Modification of three diversion structures in the Sutter Bypass reach of Butte Creek with state of the art fish ladders and fish screens which conform with state and federal standards, will contribute to the recovery of populations of federally and state listed spring-run and winter-run chinook salmon, steelhead and splittail.

Many small diversions remain to be screened, and the question is whether it is cost effective to screen them or not. DU is proposing to test the effectiveness of installing small pump screens by running a three-year monitoring project. Peter Moyle has recently raised questions about fish

screens for small pumps and this proposed project will test some of his hypotheses. The project is proposed for the East Side of the Sutter Bypass.

Uncertainty (from proposal): Eliminating a single stressor such as passage does not make it possible to accurately predict benefits to the population.

Adaptive management (from proposal): post-project monitoring will demonstrate structural conformity with state and federal standards for ladders and screens. Operation and management of structures will be coordinated with Butte Creek restoration actions to ensure effective fish passage.

Olen said they're not at the point to conduct adaptive management since they are finalizing designs and beginning construction. Once they get into implementing the Butte Sink management plan, the adaptive management requirement will be implemented as specified in the plan by the stakeholders. There is nothing in the funding at the moment that implements adaptive management.

It is difficult to monitor the project. For future projects Olen suggested taking aerial photos and also tracking water. They will run some aerial photos when the Butte Sink project is completed to see if they have corrected some of the fish passage problems. They will do some mortality counts once the water leaves the floodplain to see if there are any carcasses. Operators will be charged with daily inspections of the fish ladders to make sure they are running properly since one of the major problems can be stranding of adults below the ladders. If there is stranding, they will manipulate controls to correct the situation.

There was no pre-project monitoring to determine how much stranding occurred. Anecdotally they do know there was potential stranding as a result of weir operations. DFG will continue to carryout counts of fish populations after the project is complete.

Monitoring on structures will take place over the course of 3 years. CALFED paid for radio controlled water flow meters along many reaches of the Creek to know where the water is; data are available on the web.

Results

- **Overall success.** Olen stated that it is fairly easy to answer whether we accomplished our goals on Butte Creek: "...once we started working on fish passage issues the populations have really improved...we actually have evidence that shows that as a result of the work that has been done there are huge amounts of fish that are now left in the system...we went from 10 adult spawners in 1990-1992 and we have had 2 years in the late 90s where we have spawners exceeding 20,000 fish... cohort numbers, which are returning every three years. We are to the point now on Butte Creek during our maximum year we exceeded the spawning habitat for the number of adults that returned...we have exceeded the AFRP goals."
- Olen stated "We had a concept and started in 1998 when we first received funding for the project. There were more questions than answers in Phase 1. We took a look at those questions and answered many of them through the Phase 1b 9 reports. Then brought the stakeholder groups together to develop the best project alternative. We are now finally going into construction this year. The process evolved and we went along."

- **Stakeholder process.** Partnerships have all worked well and have different mixes depending on the area. By-and-large they generally follow similar processes to come to agreement which is to get local stakeholders to take ownership in projects. This is particularly true once they have the proper tools and help with facilitation of the process.
- Principal means of convening stakeholders was listing of salmonids, which occurred during phase 1 of the project. Once the stakeholders saw that listing would affect their ability to divert water they became motivated to work together.
- No one had really worked on a comprehensive plan for the Butte Sink prior to this process. It helped the fish and the waterfowl people since they had never sat around a table together to understand each other's problems. The facilitators broke the region into five different management areas and met over the course of three years for each region and then convened in one plenary meeting to present results. Process included field visits, input into the project structure design and subsequent changes to the plans. "We like to say we started with 125 stakeholders and haven't lost one yet." Olen said.
- **Management plan, environmental documentation and fish passage structures.** Completion of these is a win-win since the Butte Sink gets an updated, state-of-the-art water delivery system, the fisheries agencies get a management plan and structures can be operated to greatly increase passage in the region. The project has also maintained viability of agriculture in the region and, in fact, has enhanced agriculture through improved and more reliable water delivery systems.
- **Unexpected result.** Giusti Weir and Weir #1 were going to be modified for passage as part of the Sutter Bypass West Side Project, but it was estimated it would cost \$3 million. This was worth almost as much as the property they diverted water to (two ranches with 1,500 acres). So the landowners began to talk about selling water rights and taking the diversions out. DU did the due diligence, got the environmental water program involved, and is hoping for a positive outcome for this problem by selling the water rights. The land would remain in agriculture (some change to dry farming wheat and safflower), but there will still be plenty of water to farm 2/3 of the property in row crops. The goal of the project would be to take out two diversions, improve fish passage, end up with landowners satisfied with selling water rights and no loss of agricultural land.
- **Long-term benefit of collaboration and understanding the system.** "As a result of the project process we now have the whole system regionalized [and understand fish and flows better] and we know the leadership and how it works and are able to resolve any short term issues [because of established relationships with the stakeholders and agencies]."
- **Funding.** Have had strong funding for project and they wanted to share that with CALFED.

Butte Creek Sanborn Slough Bifurcation Upgrade
Interview Date: 5/8/02

CALFED Project ID: ERP-01-N16

Contact: Rob Capriola

Contract Administrator: NFWF

Interviewees (if different from Contact):

Type of Project: Fish screen/fish passage

Region: Butte Creek

Background/Project History

This was the first fish passage improvement project to be funded and implemented in the lower Butte Creek project area. Initial funding of \$1 million was obtained through the Sacramento National Wildlife Refuge. The fish ladder and control structures were completed December 1, 1999. High-flow spillway, power, and remote control were constructed in 2001 with \$1 million grant to California Waterfowl Association (CWA) which is ERP-01-N16. Used to be a gravel bar and now is a fish friendly concrete structure. Only one month after construction fish were observed passing over the structure.

Sanborn Slough bifurcation is a major water delivery structure for Butte Sink. Will be operated under a cooperative agreement by reclamation district 1004, FWS, Butte Sink Duck Clubs and the Foraker property owner. Phase 1 consisted of a fish ladder and 3 manual operation control gates. The project proponents finished Phase 2 instream work in November 2001 and by end of December the electrical and remote system operation were complete. The responsible parties are still negotiating a long-term operation agreement.

Operation of the structures tie into the Butte Sink Cooperative Management plan since timing of water delivery from the bifurcation is linked to operation of all other structures. Wild Goose Club is designated club to represent Butte Sink in the operation of the bifurcation structure.

Lessons/recommendations

- Streamline contracting—reduce the time for review, especially for implementation projects identified by CALFED in the implementation plan. “It would be to everyone’s advantage to reduce the time for review to make projects more cost effective
- Phase project—Best to split projects into phases with environmental permits and compliance done in phase 1 and construction in phase 2.
- Need a flexible contingency fund—Project manager can use the fund to complete the project. No matter how detailed the engineering plan, project will always change during construction. If a limited discretionary or flexible fund applicable to any task was available, it could meet costs for justifiable expenses. In phase 1 they decided protection needed to be installed around an expensive hydraulic unit and had to take money out of the personnel budget to cover costs. These changes were made under a more flexible FWS contract and cannot do this with CALFED funding.
- Working in a wetland/stream environment is a sensitive endeavor. Have narrow construction windows because of listed species. They were primarily concerned with giant garter snakes habitat and VELB. Restrictions from threatened and endangered species increase the cost of construction for projects. At beginning of project they conducted monitoring and realized the contractors had already cut into an elderberry bush. The bush hadn’t yet been flagged

because they were in such a rush to start construction (from delayed contracting) and contractor had to pay into mitigation.

- To be successful on a fish screen project one needs to have a responsible entity, whether it's a water district or a large diverter, rather than a large group of people, that is responsible for operation and maintenance of the structure. This would have simplified things even though the cooperative operation agreement was a benefit of the project.
- Having quality/experienced contractors and engineers is very important. One can't cut corners on cost since projects are complicated and often take place in sensitive wetland habitats with a high potential for flooding.

Project Impediments/Problems

- Contracting—biggest thing Rob faced as project manager. Getting contracting in place within the time frame to start construction was very challenging. Submitted the application in April 2000 and didn't have contract signed until September 2001—almost 18 months. During those 18 months there were 3-4 iterations of the contract. Since the budget is based on a bid, you need to pad the budget since contractors are bidding for 1-2 years in advance. Need to work this out or proponents need a longer period to implement project.
- Contracting delay effects on project construction. CWA had to adjust the construction timeframe because of the contracting delay. Construction was delayed to the point where the water level in creek was higher and contractors had additional expenses to dewater the construction site. Construction window was compressed from 4 months to 2 months which caused a cash flow problem for the contractor who had to outlay much of the money himself to pay the supplier who are on a 30 day schedule.
- Rob expected the operations agreement to be in place for the bifurcation sooner. Lawyers have delayed the process for the agreement and increased cost. Facing similar problem in other area of Butte Sink.

Information Exchange

Forums for learning and exchange include the spring run work group and the science forums that CALFED has put on, AFRP, AFSP (Anadromous Fish Screen Program), DWR, and major water districts in the area have exchanged information and met during the life the project.

Available Materials and Documents

- Powerpoint presentation Rob prepared that shows the upgrade and many pictures of structures in Butte Sink..
- Photo documentation album. Delivered in January 2002 to NFWF.
- Project briefs for tours. They have done at least 6 tours to the area.
- Existing conditions report on Butte Creek done by JSA for CWA.
- The Butte Sink Cooperative Management plan and the EA for the Sink also have good background information.

Experimental Design and Monitoring

Fish data were collected in Butte Creek area for 15 years before the project. They knew when the bifurcation structure was closed there was no passage. Extensive adult and juvenile sampling of spring run done by DFG. The data Rob recommended collecting includes key flow measurements since there were a lot of questions on flows and flow management during the

project design. Did that beforehand and only were able to do for one year. Measuring fish delay in using passage is very important.

Conceptual model they used from AFRP and DFG are used to look at changing population over time. In terms of experimental design, CWA borrowed heavily from life cycle and plans produced from AFRP and DFG management plans of salmonids and made the assumption that adult survival is a limiting factor for the viability of the population. They designed the project as an experiment to improve adult survival by reducing stress. The hypothesis of the project is reduction in delay and increased passage will reduce stress in the population and increase survival. Results are being measured by DFG surveys and on site monitoring for passage and delay.

At the micro level specific monitoring is taking place for different structure settings. Results will be used to determine the best fish passage settings for the bifurcation structure. That information will be incorporated into the operations manual. At the larger scale, monitoring is done by DFG on the population. Adaptive management is focused on limiting factors and key is focusing on limiting factors in population. Butte Sink management plan is based on assumptions of fish passage and doesn't contain much language on adaptive management.

Results

- Construction is complete, although they are still in a monitoring phase. They met the deliverable dates. Monitoring is second of two tasks. 1st deliverable date for monitoring plan was not met. Turned in plan but didn't get it approved by the date they needed to submit the deliverable so the NFWF contract manager said go ahead and collect data. Hasn't really affected the scope since they will still collect the data they need.
- Cooperative nature of funding and project another success. Stakeholders are all still speaking to each other.

Positive affects of this project and others in the Butte Sink area on salmonids. They have spent about \$30 million on ladders and screens, primarily in Upper Butte Creek and still about \$20-30 million more to spend. Fish are already responding as shown in the extensive sampling efforts done by DFG, directed by Paul Ward. Making water delivery fish and wildlife friendly has been focus of project and made it a success. Increased survival of adults by removing passage impediments. ERP

**CSU Chico Butte Creek Acquisition and Riparian Restoration, Butte Creek Watershed
Management Study
Interview Date: 5/8/02**

CALFED Project ID: ERP-97-NO6, ERP-98-F-03, ERP-96-M24

Contact: Don Holtgrieve

Contract Administrator: NFWF, FWS, MWD

Interviewees (if different from Contact):

Type of Project: Acquisition and riparian restoration

Region: Butte Creek

Background/Project History

The project began after the Butte Creek Watershed Conservancy (BCWC) was created. The Conservancy is composed of property owners and local conservation groups. The chairman of BCWC contacted the CSU foundation to apply for an existing conditions study as well as property acquisition and management grants for the watershed. Butte Creek runs through the southern boundary of Chico and has a lot of demands on the watershed for development and recreation.

Area had been mined for gravel, transforming the landscape into pools and pits, and the stream now has warm and shallow water. Primary goal of the project was habitat restoration and acquisition on the Honey Run and Virgin Valley portions of the creek with restoration primarily aimed at native species planting.

Honey Run involved acquisition and developing a management plan. It also had restoration components for exotic species removal and replanting of natives. Funds covered an appraisal report and phase 1 environmental assessment for the property.

Virgin Valley included funds for development of a management plan and restoration in the form of exotic plant species removal and replanting of natives. Virgin Valley is owned by DFG, but Chico St has an agreement for managing and carrying out more restoration on the property.

Project started in 1996 and finished at the end of 2001.

There was also an education component of the grant that funded an interpretive nature trail (accompanied by brochures) and prepared environmental education curricula for elementary school children. Education component was bolstered by unspent monitoring funds and funds for a geomorphological study completed under another study for the entire creek.

Lessons

- One of the big reasons BCWC has been successful has been involvement of local stakeholders including farmers who use downstream water and residents in canyon on the rural/urban fringe. There was also good participation in the project from the high country, represented by Sierra Pacific Industries.

Project Impediments/Problems

- Most frustrating aspect of the project did not come from CALFED or the agencies, but from the Chico St. University Foundation. In particular, the high amount of overhead the

foundation charged to administer the project with little value in return for the services, was very challenging.

- Portions of the grant were underfunded, including monitoring. As a result students and volunteers do much of the monitoring. This isn't really a problem, just a pattern that monitoring often seems underfunded.
- Project took longer than expected with two time extensions. This was attributable in part to changing personnel on the project, but it also just took longer than they anticipated.
- In the Virgin Valley unit the proponents wanted to do some planting in the streambed. Part of the stream has a levee, so it was subject to state reclamation board permitting, which they found difficult to obtain since there wasn't a policy on conservation projects and planting trees in the floodway. In the end they decided not to apply for the permit and restoration planting took place on the terraces (planting valley oak, sycamore and other hardwoods) rather than in the floodway. It turned out that the floodway is restoring itself with the sequence of willows and cottonwoods coming in on their own. They have not had to replant much, but the plantings were augmented by a Caltrans grant and will end up having planted 1000 oaks.
- At Honey Run rock cobbles and sand leftover from mining forced them to bring in more compost, mulch and irrigation than they originally thought.

Information Exchange

- Proponents communicate regularly with watershed conservancies in Deer Creek, Clear Creek and Chico Creek.
- Chico St. managed the web site for the Sacramento River Conservation Area.
- Presentations in British Columbia at a Watershed Restoration Conference, The National Association of Watersheds meeting, and the Association of American Geographers in Pittsburgh.

Available Materials and Documents

- Environmental education brochures.
- Butte Creek ecological preserve, Honey Run unit, ecological monitoring plan..
- Butte Creek ecological preserve, Honey Run unit management plan. 2000. CSUC Dept. of Geography.

Experimental Design and Monitoring

Only thing that changed in project was part of the monitoring plan. They were to do a computerized checklist for ecological monitoring. The developer of the software, however never completed the program and Chico St. set up their own monitoring. The money for this aspect of the project was transferred into the education component and students and volunteers have done much of the monitoring.

Aside from water quality monitoring they have a good pre-project inventory of data for the watershed. This includes aerial photographs and GPSing location of different vegetation patterns and communities. They also conducted a wildlife survey before and after the project. DFG is responsible for the fish counts in the Creek.

They recommend that for future projects it would be useful to have cross-sections and geomorphic data on the stream to assess the dynamics of the stream channel.

Results/Successes

- **Public response and participation**—the properties have been used a lot by school groups, outdoor enthusiasts and other outdoor recreationists. The recreation facilities have turned out to be a community asset. Stakeholder participation included farmers, forest products industry, sports fishermen, conservationists, agencies, private landowners.

Adams Dam Fish Screen and Ladder
Interview Date: 5/21/02

CALFED Project ID: ERP-96-M21

Contact: Rick Ponciano, Rancho Escuan

Contract Administrator: MWD

Interviewees (if different from Contact):

Type of Project: Fish Screen and Ladder

Region: Butte Creek

Background/Project History

Rancho Escuan is in upper Butte Creek. There are 900 acres of permanent wetlands, so flood up about 5500 acres when rice is in production. 700 acres of wetlands started in the ERP wetlands reserve program in 1990. The ranch planted trees, and duck ponds and created a wildlife environment. Area for wildlife is an easement with FWS. They hunt the property and it's a private wildlife area.

Prior to the project there was a fish ladder sans screen constructed in 1952 by the original owner of the ranch. At the time DFG came to the owner, Mr. Adams, and said diversion was impeding fish. The owner said "I'm a rice farmer if you guys build it, I'll pay for it". Total cost at the time was \$3000. The ladder worked from 52-98 since they have had fish all those years, although it is nowhere near the design and capacity of the new screen.

In 1996 Rancho Esquan was approached by DFG and FWS and asked to if they were interested in constructing a fish screen and ladder. There is one water diversion on the ranch. Rancho people initially thought it might be difficult to do but working with DFG, NMFS and FWS began to work on it and sent a proposal to CALFED. Once funded, they sent out an RFP to several engineering firms and selected Fran Borcalli and Associates whose design featured an air burst cleaning system and no sweeping on screen. Borcalli began construction, with the assistance of contractors in 1998. Fish come up through ladder and pass through 4 wedgewire sets of screen. Screen structure is about 120'l x 16'w. The screen can move about 10-80' while water is diverted off of Butte Creek. The ladders support spring and fall run chinook

Project completed its scope as outlined and contractors built what was asked for. They relied heavily on the agencies to steer them in the right direction. Project was only changed slightly—making a few changes to the height of the ladder, baffles in the ladder, delayed the construction by one month, and had to dig larger ditches and canals than previously thought but overall stayed similar to the original plan. When the ditch was dewatered around the dam, they realized that the structure was in bad condition. So they stopped the project and had some reinforcement work done on the structure with a cap on the dam, and added some rebar. Dam is good for another 100 years now.

Project partners: Metropolitan Water District and DU were the primary partners. "MWD here for obvious reasons to mitigate any damage in Bay Area or Tracy Pumps. We have a big resource here and need to share with other parts of the state until we get more storage." Owner of the ranch is a big contributor to DU and they decided to have a big contribution to fish friendliness (the owner). All worked very well together.

Lessons

- Projects take a long time by tying hands through many studies and review. Esquan went to their first spring run meeting in '88. In eleven years it took to build this project there were a lot of fish lost.
- Proponents learned that they can work with agencies. They believe the agencies have the good of fish at heart, but working with them made the project take longer and it was frustrating that it took so long

Project Impediments/Problems/Lessons

- During construction in 1998 had a lot of spring water runoff. They had predicted 220 cfs but the actual runoff was 650. This didn't actually delay the project since one of the contractors they hired had overscheduled and they started on June 15 rather than May 1. The delay worked out for the best since the high water subsided. Cost increased a little and they had to do an amendment to the contract.
- Had to mitigate for giant garter snake. They got around that by bringing all the project people together for giant garter snake identification in order to avoid take. No other real environmental issues.
- Note that Jim Well and Neil Schield said the fish screen and ladder doesn't work at Adams, because the flows are too high. Rick mentioned that they needed to make some adjustments for Adams to work

Information Exchange

- Butte Creek watershed conservancy, Butte Environmental Council, Sacramento River Preservation Group, local farmers and water users are all groups they communicate with or participate in.

Available Materials and Documents

- They have a daily log of fish activity they keep everyday that includes how much water diverted, water velocity, where fish are, and whether they're struggling in water or loitering. Use water data to make adjustments in the fish ladder. Also have an operations and maintenance log book.
- Pre-project monitoring results are available at the ranch. They are willing to share any of the data.
- Paul Ward presentation to 2002 Northern California/Nevada AFS conference on fish screens and fish data.
- No summary report for project.
- They have a photo album of the entire project in their office. They can share copies of the photos.

Experimental Design and Monitoring

They did a monitoring plan to make sure fish screen and ladder criteria were met. Have to correct the structures and make sure they comply with the criteria. Monitoring last year showed that sweeping velocities on screen too high and they will have to modify operations to change that.

Project doesn't have an experimental design, no adaptive management either. No restoration assumptions or hypotheses are being tested.

Results

- In 2002 diverting water on creek didn't notice any spring run but Paul Ward is saying there are 5-6k fish heading up into headwaters, knows it works since no loitering fish by structures. Haven't seen any adult salmon by ditches. No mechanical or structural failures. Rick said fish are thriving in the area though. In the last 3-4 years the region has had a tremendous amount of success passing fish to upper Butte Creek [many mentioned this, but some said problem is now having too many fish for available spawning habitat]. Rick said staff at the ranch have not noticed any loitering or hung-up fish by the screens and ladders. They also haven't seen any fry or large fish in the ranch's canal system.
- Was a win-win for ranch since they diverted a lot of non-fish friendly water and have proven that projects benefit fish.
- Did not lose any land to project. They gave up about 7000 AF of water @ 15-18 \$/AF in 1998 the year the project was built. They felt fortunate in that they were able to make up that deficit with wells on the ranch and they farmed just as many acres as any other year.
- Still in a learning process for screen and ladder and adjusting during different flows. Sometimes have to go monitor occasionally. Ladder operates under different regimes so a bit of a main thing for them.
- Rick said number of fish is anecdotal and noting numbers of fish in Butte Creek Canyon. They haven't seen any physical evidence of fish to indicate they have had any problems coming through the system. John Icanberry mentioned that prior to these projects would see fish with noticeable wounds and damage on body.

Butte Creek Overview Summaries

Interviewees: Paul Ward (5/20/02), John Icanberry (6/3/02)

Region: Butte Creek Watershed

Lessons

- There's a need to focus on local development and have science related staff help with recrafting proposals from local stakeholders that need to be strengthened.
- Need to have patience, perseverance and a long time frame for this type of work. Much of the work in Butte Creek started in 1983 when they started identifying the needs in the region.
- Need to communicate with all constituencies. Biologists can easily speak with each other, but need to speak to lay people as well.
- In the long term need to make sure operations and management are in place for new structures.
- Sufficient funding for projects has been crucial.
- Outstanding project management and good process have led to many of the successes in the region. Had a diverse group of stakeholders with farmers, duck clubs, irrigation companies and with their own agendas. Both CWA and DU have done excellent work managing projects and working with agencies.
- Partnerships have worked well. Many people are better off with the structures than before they started. There have been major disagreements or even periods when the project almost came apart, but patience and perseverance paid off.

Impediments/Challenges

- Large scale projects are requiring new layers of regulation and additional players which makes the work more challenging.
- CALFED process has become cumbersome and bureaucratic. This has made it more difficult to sell projects to stakeholders. The process for developing a project and project selection has changed from submitting proposals and approval to many selection panels that include people from outside the region and a lot of emphasis on pure and not applied science. Paul suggested somehow getting more people in the selection process with long-term institutional knowledge. The process needs unbiased panel members who know different regions.

There's a need to focus on local development and have science related staff help with recrafting proposals from local stakeholders that need to be strengthened. Icanberry added that this challenge adds up to lack of flexibility and CALFED is not able to respond to opportunities that need rapid funding. He recommended streamlining the PSP review process.

PROJECT LEVEL REVIEW INTERVIEWS
6/17/02

Channel Dynamics and Sediment Transport

Project ID	Title	Awarded	Interviewed	Organization	Interview Date
ERP-97-C11	Gravel at Basso Bridge	\$250,975.00	Clarence Mayott	CA Dept of Fish & Game	Tim Heyne, DFG, 6/6/02
ERP-01-N06	Revised Phase 2 - Merced River Salmon Habitat Enhancement: River Mile 42-44 (Robinson Ranch Site)	\$1,699,101.00	Fred Jurick	CA Dept of Fish & Game	Fred Jurick interviewed 5/5/02 as suggested by Richard Dixon original contact
ERP-97-M08	Tuolumne River Channel Restoration (Pool 9)	\$2,353,100.00	Wilton Fryer	Turlock Irrigation District	5/21/02
ERP-98-F11	Merced River Salmon Habitat Enhancement (Phase III)	\$2,433,759.00	Fred Jurick	CA Dept of Fish & Game	5/5/02
ERP-98-F15	Lower Clear Creek Floodway Restoration Project (Phase II)	\$3,559,596.00	Hide Nakamisha	Western Shasta RCD	6/6/02
ERP-99-B05	Merced River Salmon Habitat Enhancement (Phase I: Ratzlaff Reach)	\$1,586,350.00	Fred Jurick	CA Dept of Fish & Game	5/5/02
ERP-97-N21	Knights Ferry Gravel Replenishment	\$536,410.00	Carl Mesick	Carl Mesick Consultants	5/17/02

PROJECT LEVEL REVIEW INTERVIEWS
6/17/02

Restoration of Multiple Habitats

Project ID	Title	Awarded	Interviewed	Organization	Interview Date
ERP-97-N02	Sacramento River Floodplain Acquisition - Natural Process Restoration	\$9,879,800.00	Dawit Zeleke, Mike Roberts, Greg Golet, Ryan Luster, Wendie Duron	The Nature Conservancy	All five were interviewed as a group for 4 projects on 5/28/02. Also a field visit to their Flynn restoration site on same day
ERP-97-N03A	Sacramento River Floodplain Acquisition - Riparian Forest Restoration	\$780,000.00			All five were interviewed as a group for 4 projects on 5/28. Also a field visit to their Flynn restoration site on same day
ERP-97-N03B	Sacramento River Floodplain Acquisition and Riparian Restoration	\$512,500.00			All five were interviewed as a group for 4 projects on 5/28. Also a field visit to their Flynn restoration site on same day
ERP-97-N04	Sacramento River Meander Restoration	\$898,700.00			All five were interviewed as a group for 4 projects on 5/28. Also a field visit to their Flynn restoration site on same day
ERP-97-N14	Cosumnes Start-Up Stewardship and Restoration	\$1,985,100.00	Ramona Swenson	The Nature Conservancy	5/17/02
			Becky Waegell		5/10/02
			Lizbeth Jacobsen		5/24/02

PROJECT LEVEL REVIEW INTERVIEWS
6/17/02

Shallow Water Tidal and Marsh Habitat

Project ID	Title	Awarded	Interviewed	Organization	Interview Date
ERP-96-M10	Research to Predict Evolution of Restored Diked Wetlands	\$575,172.00	Si Simenstad	UW	6/5/02
ERP-97-N12	Franks Tract Restoration	\$323,186.00	Rick Roads	Moffat and Nichol Engineers	6/6/02
ERP-97-N19	Tolay Creek Restoration	\$283,000.00	Olen Zirkle	Ducks Unlimited, Inc.	Previously interviewed Olen for another project. Substituted Tolay for Wilms ranch
ERP-98-C03	Hamilton Wetlands Restoration Planning	\$1,025,015.00	Tom Gandesbery	California Coastal Commission	6/3/02
			Steve Goldbeck	BCDC	6/6/02
ERP-98-F23	South Napa River Tidal Slough and Floodplain Restoration Project	\$1,490,000.00	John Wankum	City of American Canyon	6/3/02
			Mark Joseph	City of American Canyon	6/4/02
ERP-99-B13	Understanding Tidal Marsh Restoration Processes & Patterns	\$1,042,246.00	Charles A Simenstad	University of Washington	6/5/02

PROJECT LEVEL REVIEW INTERVIEWS
6/17/02

Butte Creek Basin

Project ID	Title	Awarded	Interviewed	Organization	Interview Date
ERP 99-B02	Lower Butte Creek Project Phase II	\$775,000.00	Olen Zirkle	Ducks Unlimited, Inc.	5/6/02
ERP 01-N54	Lower Butte Creek Project Phase III	\$4,783,719.00	Olen Zirkle	Ducks Unlimited, Inc.	Interviewed on 5/6 for phase I, II
ERP-97-N06	CSU Chico Butte Creek Acquisition and Riparian Restoration	\$187,128.00	Don Holtgrieve	CSU Chico	5/9/02
ERP 98-F03	CSU Chico Butte Creek Acquisition and Riparian Restoration	\$125,000.00	Don Holtgrieve	CSU Chico	5/9/02
ERP-96-M24	Butte creek watershed management study		Don Holtgrieve	CSU Chico	5/9/02
13593	Riparian corridor mapping on Butte Creek	\$145,200	Don Holtgrieve	CSU Chico	5/9/02
ERP 01-N16	Butte Creek/Sanborn Slough Bifurcation Upgrade Project	\$1,000,000.00	Robert Capriola	California Waterfowl Association	5/8/02
ERP-97-M03	Gorrill Dam Screen and Ladder	\$369,641.00	Jim Well	Ducks Unlimited, Inc.	Interviewed Jim and Neil on 5/23/02
			Neil Schild	MWH	Interviewed Jim and Neil on 5/23
ERP-96-M21	Adams Dam Fish Screen & Ladder	\$70,304.00	Rick Ponciano	Rancho Escuan	5/22/02
ERP-96-M01	Western Canal Water District Butte Creek Siphon		Ted Trimble	Western Canal Water District	5/24/02

	Contact	Organization	Interview Date
Butte Creek Overview Interviews	Paul Ward	DFG	5/20/02
	Dave Ceppos	JSA	5/24/02
	John Icanberry	FWS	6/3/02
Butte Creek Stakeholder Interviews	Ron Long	Butte Slough Irrigation Co.	5/12/02
	Dick Akin		Could not connect, although he was willing, just tied up with wheat planting
	Nicole Van Vleck	Montna farms	Never returned call
Additional Recommended Interviews			
Wilms Ranch	Stephi Spaar	DWR	6/30/02
Category III project on levees in 3 counties	Scott Clemmons	WCB	Phoned never returned call
		Total interviewed	32

APPENDIX E

Summary of ERP-Funded Projects by Region and Project Type

Delta & East Side Tributaries Region

# of Projects	\$ Awarded
72	\$108,470,729

Habitat Metrics	# of Acres
Habitat Protection	30,216
Habitat Restoration	19,671
Floodplain	10,450
	# of Miles
Riparian Corridor	27
Instream Habitat	18

Types of Projects	# of Projects	\$ Awarded
Channel Dynamic and Sediment Transport	5	\$4,315,980
Ecosystem Water & Sediment Quality	11	\$8,811,063
Environmental Education	3	\$364,891
Environmental Water Management	0	\$0
Fish Screens & Passage	8	\$4,511,505
Fishery Assessment	5	\$1,582,021
Flood Plains and Bypasses	7	\$9,373,821
Local Watershed Stewardship	5	\$801,508
Natural Flow Regimes	1	\$2,521,236
Nonnative Invasive Species	1	\$152,233
Restoration of Multiple Habitats	8	\$22,655,810
Riparian Habitat	3	\$2,225,980
Shallow Water Tidal and Marsh Habitat	12	\$14,289,007
Special Status Species	0	\$0
Uplands and Wildlife Friendly Agriculture	3	\$36,855,674

Eco Zones	# of Projects	\$ Awarded
1.0 Sacramento-San Joaquin Delta	25	\$48,248,839
1.1 North Delta	17	\$21,702,252
1.2 East Delta	4	\$9,701,980
1.3 South Delta	0	\$0
1.4 Central and West Delta	9	\$7,852,589
11.0 Eastside Delta Tributaries	5	\$7,303,378
11.1 Cosumnes River	7	\$9,514,691
11.2 Mokelumne River	4	\$2,641,000
11.3 Calaveras River	0	\$0

Sacramento River Region

# of Projects	\$ Awarded
118	\$129,439,704

Habitat Metrics	# of Acres
Habitat Protection	14,002
Habitat Restoration	2,665
Floodplain	3,162
	# of Miles
Riparian Corridor	32
Instream Habitat	4

Types of Projects	# of Projects	\$ Awarded
Channel Dynamic and Sediment Transport	2	\$3,620,596
Ecosystem Water & Sediment Quality	3	\$1,934,400
Environmental Education	7	\$1,826,808
Environmental Water Management	0	\$0
Fish Screens & Passage	46	\$82,428,440
Fishery Assessment	10	\$4,797,334
Flood Plains and Bypasses	1	\$210,000
Local Watershed Stewardship	26	\$9,149,119
Natural Flow Regimes	1	\$418,700
Nonnative Invasive Species	1	\$360,000
Restoration of Multiple Habitats	11	\$17,128,300
Riparian Habitat	7	\$4,101,840
Shallow Water Tidal and Marsh Habitat	1	\$1,000,000
Special Status Species	0	\$0
Uplands and Wildlife Friendly Agriculture	2	\$2,464,167

Eco Zones	# of Projects	\$ Awarded
3.0 Sacramento River	17	\$19,334,807
3.1 Keswick Dam to Red Bluff Diversion Dam	11	\$13,678,638
3.2 Red Bluff Diversion Dam to Chico Landing	5	\$2,859,778
3.3 Chico Landing to Colusa	5	\$9,200,000
3.4 Colusa to Verona	3	\$2,649,000
3.5 Verona to Sacramento	7	\$9,088,995
4.0 North Sacramento Valley	0	\$0
4.1 Clear Creek	6	\$4,994,403
4.2 Cow Creek	0	\$0
4.3 Bear Creek	0	\$0

4.4 Battle Creek	10	\$34,517,152
5.0 Cottonwood Creek	1	\$360,500
5.1 Upper Cottonwood Creek	1	\$161,000
5.2 Lower Cottonwood Creek	1	\$61,000
6.0 Colusa Basin	2	\$1,091,500
6.1 Stony Creek	0	\$0
6.2 Elder Creek	0	\$0
6.3 Thomas Creek	0	\$0
7.0 Butte Basin	4	\$1,890,565
7.1 Paynes Creek	0	\$0
7.2 Antelope Creek	0	\$0
7.3 Mill Creek	5	\$3,163,845
7.4 Deer Creek	1	\$196,554
7.5 Big Chico Creek	3	\$2,313,781
7.6 Butte Creek	13	\$4,944,651
7.7 Butte Sink	2	\$859,938
8.0 Feather River & Sutter Basin	0	\$0
8.1 Feather River	1	\$1,009,400
8.2 Yuba River	6	\$3,641,368
8.3 Bear River and Honcut Creek	0	\$0
8.4 Sutter Bypass	1	\$4,783,719
9.0 American Basin	2	\$425,780
9.2 Lower American River	4	\$613,765
10.0 Yolo Basin	5	\$5,095, 248
10.1 Cache Creek	0	\$0
10.2 Putah Creek	1	\$100,500
10.3 Solano	0	\$0
10.4 Willow Slough	2	\$2,100,167

San Joaquin River Region

# of Projects	\$ Awarded
42	\$59,505,257

Habitat Metrics	# of Acres
Habitat Protection	10,652
Habitat Restoration	8,654
Floodplain	2,215
	# of Miles
Riparian Corridor	32
Instream Habitat	37

Types of Projects	# of Projects	\$ Awarded
Channel Dynamic and Sediment Transport	15	\$19,844,747
Ecosystem Water & Sediment Quality	3	\$2,973,257
Environmental Education	3	\$167,680
Environmental Water Management	3	\$5,969,803
Fish Screens & Passage	3	\$1,213,875
Fishery Assessment	3	\$710,999
Flood Plains and Bypasses	3	\$4,688,850
Local Watershed Stewardship	3	\$1,446,352
Natural Flow Regimes	0	\$0
Nonnative Invasive Species	0	\$0
Restoration of Multiple Habitats	3	\$18,807,233
Riparian Habitat	2	\$962,376
Shallow Water Tidal and Marsh Habitat	0	\$0
Special Status Species	1	\$2,720,085
Uplands and Wildlife Friendly Agriculture	0	\$0

Eco Zones	# of Projects	\$ Awarded
12.0 San Joaquin River	13	\$17,633,777
12.1 Vernalis to Merced River	4	\$9,206,233
12.2 Merced River to Mendota Pool	0	\$0
12.3 Mendota Pool to Gravelly Ford	0	\$0
12.4 Gravelly Ford to Friant Dam	0	\$0
13.1 Stanislaus River	2	\$3,626,410
13.2 Tuolumne River	14	\$17,874,190
13.3 Merced River	6	\$6,422,122
14.0 West San Joaquin Basin	2	\$2,022,440

Bay Region

# of Projects	\$ Awarded
39	\$16,676,918

Habitat Metrics	# of Acres
Habitat Protection	2,843
Habitat Restoration	8,092
Floodplain	303
	# of Miles
Riparian Corridor	2
Instream Habitat	4

Types of Projects	# of Projects	\$ Awarded
Channel Dynamic and Sediment Transport	0	\$0
Ecosystem Water & Sediment Quality	3	\$985,004
Environmental Education	3	\$691,384
Environmental Water Management	0	\$0
Fish Screens & Passage	2	\$628,200
Fishery Assessment	0	\$0
Flood Plains and Bypasses	0	\$0
Local Watershed Stewardship	10	\$2,533,643
Natural Flow Regimes	0	\$0
Nonnative Invasive Species	4	\$2,525,687
Restoration of Multiple Habitats	0	\$0
Riparian Habitat	0	\$0
Shallow Water Tidal and Marsh Habitat	16	\$9,134,111
Special Status Species	1	\$178,889
Uplands and Wildlife Friendly Agriculture	0	\$0

EcoZones	# of Projects	\$ Awarded
2.0 Suisun Marsh & North San Francisco Bay	5	\$2,572,045
2.1 Suisun Bay & Marsh	11	\$3,658,940
2.2 Napa River	8	\$6,000,644
2.3 Sonoma Creek	4	\$1,569,093
2.4 Petaluma River	5	\$1,718,470
2.5 San Pablo Bay	0	\$0
2.6 Central & South San Francisco Bay	6	\$1,157,726

Multi-Regional

# of Projects	\$ Awarded
49	\$21,847,517

Habitat Metrics	# of Acres
Habitat Protection	0
Habitat Restoration	0
Floodplain	0
	# of Miles
Riparian Corridor	0
Instream Habitat	0

Types of Projects	# of Projects	\$ Awarded
Channel Dynamic and Sediment Transport	0	\$0
Ecosystem Water & Sediment Quality	10	\$12,143,708
Environmental Education	12	\$835,710
Environmental Water Management	0	\$0
Fish Screens & Passage	3	\$962,000
Fishery Assessment	7	\$2,045,383
Flood Plains and Bypasses	0	\$0
Local Watershed Stewardship	3	\$1,066,558
Natural Flow Regimes	0	\$0
Nonnative Invasive Species	12	\$2,842,489
Restoration of Multiple Habitats	1	\$1,100,000
Riparian Habitat	0	\$0
Shallow Water Tidal and Marsh Habitat	0	\$0
Special Status Species	1	\$851,669
Uplands and Wildlife Friendly Agriculture	0	\$0

APPENDIX F

Summary of Responses to On-Line Survey

CALFED ERP Project Survey Results

1. What is the ID number for your CALFED Project?

Answers are not applicable to results

2. Has the project changed since it was awarded?

59% (13/22)	Yes, minor changes
9% (2/22)	Yes, major changes
32% (7/22)	No

3. Indicate any problems/impediments you have encountered during the life of the project (check all that apply):

61% (23/38)	Contractual with CALFED or other parties
8% (3/38)	Permitting or regulatory
8%	Financial
8%	Limited staff resources

3a. Indicate how these problems/impediments have affected the project:

4% (1/18)	Increased the budget
72% (13/18)	Delayed the schedule
4%	Other, delayed the next phase
4%	Other, payment delay
4%	Other, lack of staff support

4. To what degree have you shared technical information regarding your project with individuals working on other similar ERP funded projects?

26% (6/23)	Extensively
39% (9/23)	Somewhat
22% (5/23)	Very little
13% (3/23)	Not at all

5. Has this project followed an explicit conceptual model or a specific experimental design (check all that apply)?

46% (13/28)	Yes, a conceptual model
21% (6/28)	Yes, a specific experimental design
18% (5/28)	Yes, a conceptual model or experimental design
14% (4/28)	No

6. Has this project generated papers or presentations not included in project deliverables? (Please check all that apply and indicate the number of papers or presentations.)

4% (2/48) Yes - published refereed (peer reviewed) journal articles
 13% (6/48) Yes - gray literature
 17% (8/48) Yes - newspaper and magazine articles
 19% (9/48) Yes - presentations at conferences
35% (17/48) Yes - informal presentations
 13% (6/48) No

233 total papers, conferences and presentation. Will include numbers by category in final version.

7. If the project has involved habitat protection or restoration, please indicate what habitat types are covered in the project area? (Please check all that apply and indicate the approximate number of acres.)

Habitat Type	Times Chosen	Total Acres
Riparian riverine aquatic	12	6,183
Tidal slough	4	37
Saline emergent wetlands (tidal)	6	200.04
Wildlife friendly agriculture	9	20,450
Tidal perennial aquatic	4	34
Mid channel islands	3	4.94
Seasonal wetland	4	10,510
Perennial grasslands	3	250
Fresh emergent wetland	4	150
Vernal pools	2	no answer
Inland dune scrub	1	no answer
Deep ocean water - nontidal perennial	1	no answer
Shallow ocean water – nontidal perennial	1	no answer
Shoals	1	no answer

8. Have pre- and post-project monitoring and comparisons been undertaken (check all that apply)?

4% (1/22) Yes, and the comparison have been made
 14% (3/22) Yes, but data analysis is not yet completed
 0% (0) Yes, but limitations in pre-project data reduce value of comparisons
32% (7/22) No, data are still being collected
 27% (6/22) No, post project data collection hasn't begun yet
 23% (5/22) No, comparisons cannot or will not be made

82% said No

9. Have performance measures been established by which to judge the success of this project?

57% (12/21)	Yes, and they are being monitored
19% (4/21)	Yes, but they're not being monitored
24% (5/21)	No

10. On a scale of 1 to 10, with 10 being best, how would you rate your experience with CALFED for this project?

Scores averaged 7.5 of 10.

Negative comments evolved around contract delays and difficulty in communication due to size.

7 respondents (of a total 13 with NFWF as project administrator) gave enthusiastic kudos to NFWF's administration of projects in their comments on this section. This response was unsolicited. 1 respondent (of a total 2 with UFWFS as project administrator) gave similar positive comments to USFWS.

11. What three things would you say most affected the success of this project?

Based on the survey results, most people thought that the overall cooperation, professionalism, and expertise from people involved in the project have been excellent. They also commented positively on the support from agency personnel. A few of the negative areas included delay in contracts and difficulty coordinating due to the overall size and scale of the project.

12. What kinds of unexpected results have been encountered?

Overall, unexpected results were encountered with fisheries, revegetation challenges, and regulations for archeology resources, difficulty coordinating with CALFED staff, although most answers stated that results had not been obtained at the time of this survey.

13. What suggestions do you have for improving the CALFED ERP program?

Overall suggestions for improving the CALFED ERP program included the following: improving the contracting and payment procedures, streamlining/adjusting the reporting process for education grants, get more (esp. Federal) funding, going after Water Conservation in a big way, increasing local level staffing, get moving on all the important work that needs to be done, improving the PSP process, retain staff charged with coordinating with programs and projects, following efforts through to completion - delivering a product, and establishing ERP program staff communication and coordination protocols.